# SQUIRE'S COMPANION
TO THE
# BRITISH PHARMACOPŒIA

SIXTEENTH EDITION
1894

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# COMPANION

TO THE LATEST EDITION OF THE

# BRITISH PHARMACOPŒIA.

SIXTEENTH EDITION.

# COMPANION

TO THE LATEST EDITION OF THE

# BRITISH PHARMACOPŒIA,

COMPARING THE STRENGTH OF ITS VARIOUS PREPARATIONS
WITH THOSE OF THE
UNITED STATES, AND OTHER FOREIGN PHARMACOPŒIAS,
TO WHICH ARE ADDED
NOT OFFICIAL PREPARATIONS, AND
PRACTICAL HINTS ON PRESCRIBING.

BY
PETER SQUIRE.

Sixteenth Edition.

REVISED
BY
PETER WYATT SQUIRE, F.L.S., F.C.S.
AND
ALFRED HERBERT SQUIRE,
JOINTLY CHEMISTS IN ORDINARY ON THE ESTABLISHMENT OF THE QUEEN,
CHEMISTS IN ORDINARY TO H.R.H. THE PRINCE OF WALES.

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In Memory of

SIR JAMES CLARK, BART., K.C.B., M.D., F.R.S.

*To whom, by his permission, the former Editions were dedicated, and whose death, at the mature age of* 82, *was lamented by her Majesty and the whole of the Royal Family; and by the Medical Profession, of which he was one of the brightest ornaments.*

*He was not only a wise physician, but a man of sound judgment and quick perception. His hand was ever ready to help the unfortunate and to assist the deserving; and some who have risen to the highest professional eminence owe their success in a great measure to his counsel and advice during their early career.*

*He was much interested in Pharmacy, and through his influence the Pharmaceutical Society sent its delegate to take part in the formation of the British Pharmacopœia.*

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# PREFACE

## TO SIXTEENTH EDITION.

SINCE the publication of our Fifteenth Edition, the time has been expended in the collection of information from various sources, and in experimental work; the results are here embodied and will be found under the several headings.

Comparative experiments have also been made with pill-excipients, but to economise space, the best one only for each substance has been included; it follows the dose.

To facilitate reference, three letters have been placed at the top of each page as an indication of the first heading to be found thereon.

For distinction, the contents of the British Pharmacopœia have been printed in large type, and all Unofficial matter in small type, with the exception of the paragraphs commencing "Solubility" and "Medicinal Properties," also interpretations following Official tests in the same sentence. The Official Synonyms are distinguished as *B.P.Syn.*, others given for Official substances as *N.O.Syn.*

Our comparisons of the Foreign Pharmacopœias have been revised with the following new editions:—Danish 1893, German

1890, Russian 1891, Swiss 1893, United States 1893. The New Italian Pharmacopœia has been added to our list, which now numbers fifteen.

Owing to the heavy expenses connected with the production of this book, it has been found necessary to increase the price from ten shillings and sixpence to twelve shillings and sixpence. The matter has been enlarged by 120 pages, in addition to the 70 pages embodied in the last Edition. The size of the book, however, has been kept within reasonable limits by printing the Index in double column, thereby reducing it 60 pages.

P. W. SQUIRE.
A. H. SQUIRE.

413, Oxford Street,
*March* 1, 1894.

The edition having been sold out, the work has been reprinted.

*December*, 1894.

# PREFACE

## TO FIRST EDITION.

This Volume has been written to supply a want which has been generally felt since the publication of the British Pharmacopœia.

The weight which has been adopted by the Medical Council is the avoirdupois pound; it is divided into sixteen ounces, each of which contains 437·5 grains. This weight presents many difficulties in practice, as many of the ingredients have to be expressed in grains. The quantities of the several preparations made at different dispensing establishments will vary according to the amount of business done, so that a calculation has to be made in almost every case. This is no easy matter. If we take for example the formula for Compound Tincture of Benzoin, and wish to prepare half a gallon, it will be necessary to multiply the number of grains of each ingredient ordered by 4, and to divide the number thus obtained by 437·5, to reduce it to ounces. In these cases highly inconvenient weights are obtained, consisting for the most part of ounces and odd numbers of grains. To remedy this defect I have, as far as practicable, expressed the formulæ in parts, which may be regarded either as pounds, quarter-pounds, or ounces, or indeed any weights, English or foreign. The liquids, however, are always directed to be measured: I have therefore placed at the top of each page this general direction, "Solids by weight, liquids by measure."

It must be remembered, then, that should the parts be considered to represent ounces, the fluid ounce must be used for liquids, the avoirdupois ounce for solids. On the Continent every substance, liquid and solid, is directed to be weighed, and this has caused one of the chief difficulties I have had to encounter. The reduction to the English method has been effected in every case as accurately as possible, but as the specific gravity of each liquid has entered into the calculation, I must claim indulgence for any error which may have crept in.

Although the American weights, like those of the late London and Edinburgh Pharmacopœias, are troy, the pint is only sixteen avoirdupois ounces; this has caused an additional difficulty in obtaining an accurate comparison.

Looking at the anomalous condition of the weights and measures in England and America, we can only hope that Parliament will shortly establish some scheme by which our system may be made to harmonize, and rendered easily comparable with those of foreign countries.

The object of referring to the preparations of foreign Pharmacopœias in the present Work, is to enable prescribers to regulate the prescriptions of patients going abroad, where preparations similar in name but different in composition may be employed. For this purpose the last editions of the French, Belgian, Prussian, Austrian, and United States Pharmacopœias have been taken. This comparison may perhaps even be useful, should foreign countries attempt to assimilate their Pharmacopœias to the British or those of other countries. A similar comparison of the three Pharmacopœias which I made some years ago, was found so useful in the preparation of the British Pharmacopœia, that each member of the Committee was furnished with a copy.

The doses are given to the best of my own judgment in many cases, and in others from the most accredited authorities; and I have stated the solubility of substances in different liquids in those cases where the information seemed likely to be useful. This will enable prescribers to see at once how much the liquid present will take up, and the greater or less solubility in different fluids will indicate the best mode of prescribing.

I have also explained the action of the Tests given in the Pharmacopœia for ascertaining the purity of the substances employed; indicating in each case the particular impurity which may be suspected.

In arranging the Work, I have thought it best to class each preparation under the head of the chief drug which it contains; by this plan a prescriber who wishes to employ any particular substance will find all the preparations made from it, and see at a glance their composition and the proportions of the ingredients.

In addition to this will be found in the alphabetical order a list of preparations in each group, such as Infusions, Tinctures, etc., where the relative proportions of the active ingredients are also shown.

The medicinal properties of the respective preparations have been collated from the best authorities. I am indebted to Dr. Sieveking for various suggestions as the Work has passed through the press; and have ventured to add some hints as to the best mode of prescribing, which have from time to time occurred to me.

As the arrangement of this Volume is strictly alphabetical, an Index has been thought unnecessary.

In conclusion, I may say, that knowing something of the wants of both Pharmaceutists and Prescribers, I have endeavoured to make the book as practical as possible, and I trust that the labour bestowed upon it will not be without some result.

THE AUTHOR.

277, Oxford Street,
*June*, 1864.

# PREFACE

## TO SECOND EDITION.

THE very flattering reception given to the First Edition of this work, and the fact that in one month after its publication more than three-fourths of the issue had been sold by the Publishers, have induced the Author to revise with great care the several parts of the work.

In the present Edition the medicinal properties and doses have been re-examined, the references to Foreign Pharmacopœias made more complete by the addition of the names employed in such Pharmacopœias, and although much new matter has been added, the contents of the British Pharmacopœia have been kept clear and distinct, by placing over every preparation not contained in it, the words "Not Official."

To this latter class there have been considerable additions made.

The proportions and doses are now annexed to all the groups, and an Index has been supplied, combined with a posological table. In short, no pains have been spared to put the information in such a form as to be very easy of reference both to the Prescriber and Dispenser.

The Author begs to thank the numerous friends who have taken an interest in the work, for their many valuable suggestions.

277, OXFORD STREET,
*October* 1, 1864.

# PREFACE

## TO FIFTEENTH EDITION.

This edition has been in preparation for over twelve months, and has been delayed longer than was expected owing to the large quantity of matter to be collated, digested, and condensed; also to the experimental work necessarily involved in the elucidation of controversial matter or disputed points. Some of the substances, such as Aconitine and Eucalyptol, necessitated a complete scrutiny of the literature on the subject, and the examination of specimens from various reliable sources.

A large quantity of new matter of a practical nature will be found interspersed throughout the work, partly as notes on Official substances, also under Not Official headings.

Notwithstanding much condensation, and the deletion of matter which has become obsolete, we have been compelled to enlarge the size of the book by seventy pages.

Some slight alterations have been made in the type so as to facilitate reference to the various sections into which each subject is divided.

Seven foreign Pharmacopœias have been added to our previous list, and the alterations in the new edition of the Austrian Pharmacopœia have been noted. We regret that the long-expected Official Italian Pharmacopœia has not yet appeared.

The Medicinal Properties and Therapeutic Index have been revised and compared with standard medical works, more particularly Quain's "Dictionary" and Ringer's "Therapeutics"; the references to current literature have also been extended.

The Antidotes have also received attention, and additions have been made from Murrell's "What to do in cases of Poisoning."

The Solubilities, as heretofore, are the result of actual experiment; they have been taken at 60° F. (without previous heating), except in some cases where Glycerine or Oil has been used as the solvent.

The Pharmacopœial Tests have also been scrutinised, and when at variance with results obtained from the best commercial samples, this has been noted.

Much work has been done with a view to obtain complete and at the same time correct information as to the Chemistry and Pharmacy of the Materia Medica; but the published matter in the English and foreign journals is so voluminous and often so contradictory, that we have been unable in all cases to complete the necessary experiments for arriving at a satisfactory conclusion.

Our work in this direction is being continued, and by this means we hope to maintain the reputation of the "Companion" as a standard book of reference.

P. W. SQUIRE.
A. H. SQUIRE.

413, Oxford Street,
*March* 1, 1890.

## SYMBOLS AND ATOMIC WEIGHTS OF THE ELEMENTARY BODIES MENTIONED IN THE BRITISH PHARMACOPŒIA.

| Elementary Bodies. | Symbols and Atomic weights. |
|---|---|
| Aluminium | Al = 27 |
| Antimony (Stibium) | Sb = 120 |
| Arsenium | As = 75 |
| Barium | Ba = 137 |
| Bismuth | Bi = 209 |
| Boron | B = 11 |
| Bromine | Br = 80 |
| Calcium | Ca = 40 |
| Carbon | C = 12 |
| Cerium | Ce = 141 |
| Chlorine | Cl = 35·5 |
| Chromium | Cr = 52·5 |
| Copper (Cuprum) | Cu = 63·4 |
| Gold (Aurum) | Au = 196·5 |
| Hydrogen | H = 1 |
| Iodine | I = 127 |
| Iron (Ferrum) | Fe = 56 |
| Lead (Plumbum) | Pb = 207 |
| Lithium | L = 7 |
| Magnesium | Mg = 24 |
| Manganese | Mn = 55 |
| Mercury (Hydrargyrum) | Hg = 200 |
| Nitrogen | N = 14 |
| Oxygen | O = 16 |
| Phosphorus | P = 31 |
| Platinum | Pt = 195 |
| Potassium (Kalium) | K = 39 |
| Silver (Argentum) | Ag = 108 |
| Sodium (Natrium) | Na = 23 |
| Sulphur | S = 32 |
| Tin (Stannum) | Sn = 118 |
| Zinc | Zn = 65 |

## THE WEIGHTS AND MEASURES OF THE BRITISH PHARMACOPŒIA, AT THE TEMPERATURE OF 60° FAHRENHEIT.

### WEIGHTS.

The Avoirdupois pound = 16 oz. = 7000 grs.
1 oz. = 437·5 grs.
1 gr. = 1 gr.

### MEASURES.

The Imperial gallon contains 277·274 cubic inches of distilled water at 60° F.

| | | | | | |
|---|---|---|---|---|---|
| C | 1 gallon | = 8 pints, | weighing 10 pounds, | contains | 76,800 minims. |
| O | 1 pint | =20 fluid ounces | „ 1¼ „ | „ | 9,600 „ |
| fl. oz. | 1 fluid ounce | = 8 fluid drachms | „ 437·5 grains | „ | 480 „ |
| fl. dr. | 1 fluid drachm | =60 minims | „ 54·68 „ | „ | 60 „ |
| ♏ | 1 minim | | „ ·91 grain | „ | 1 minim. |

It must be remembered that the minim is less than the grain measure; hence, although in Tinct. Opii there is 1 in 13½ grain-measures, there is only 1 in 14⅔ minims.

To find the number of gallons any rectangular vessel will hold, multiply the length in inches by the breadth, and the product by the depth in inches, then divide the total by 277·274, which is the number of cubic inches contained in the gallon.

Graduated measures require testing before use, which is easily done with good weights and scales, and distilled water. Every fluid ounce of distilled water ought to weigh an ounce avoirdupois, but there are two lines on the surface of a liquid; the upper one is that of capillary attraction to the sides of the vessel; the lower one the exact surface of the fluid. This should be on a line with the eye to measure accurately.

The Continental Pharmacopœias give the formulas in parts by weight; in some instances the gramme is indicated as the unit.

The formulas in the United States Pharmacopœia are now given in grammes and cubic centimetres.

The British Pharmacopœia still gives the formulas in weights and measures; the proportions are also expressed in parts, but the two systems do not always agree. Liquids are as a rule ordered by measure and fluid parts, but there is no uniformity in this: for instance, Olive Oil is by measure in Unguentum Hydrargyri Nitratis, but by weight in Unguentum Hydrargyri Composita; Glycerine is by measure in the Glycerines, but by weight in Linimentum Iodi; Glacial Acetic Acid is by measure in Acetum Cantharidis and Mistura Creasoti, but by weight in Linimentum Terebinthinæ Aceticum; Castor Oil is by measure in Pilula Hydrargyri Subchloridi Composita, but by weight in Collodium Flexile.

The British Pharmacopœia is used in India and all the British colonies.

## WEIGHTS AND MEASURES EMPLOYED FOR MEDICINE IN ENGLAND, SCOTLAND, AND IRELAND.

Formerly the wine measure of 16 oz. to the pint, and the apothecaries' or troy weight were used for medicine.

We have now the imperial measure of 20 oz. to the pint, and the imperial pound of 16 oz., with 437·5 grs. to the oz., as ordered in the British Pharmacopœia, and the Act of Parliament insists that all sales shall be made by this imperial standard.

Permission has, however, been given to sell drugs by retail by the apothecaries' weight (troy weight).

The author has thought that, to avoid confusion, he had better confine himself in all the formulas to the oz. (=437·5 grs.) and grain, for weight, and to the fluid oz. (weighing 437·5 grs.), fluid drachm, and minim, for measure.

## EQUIVALENTS OF ENGLISH WEIGHTS TO FRENCH GRAMMES.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 pound avoirdupois | 7000 grains | or | 16 ounces | = | 453·592 | French grammes. |
| | 6562·5 | or | 15 | = | 425·2425 | ,, ,, |
| | 6125 | or | 14 | = | 396·8930 | ,, ,, |
| | 5687·5 | or | 13 | = | 368·5435 | ,, ,, |
| | 5250 | or | 12 | = | 340·1940 | ,, ,, |
| | 4812·5 | or | 11 | = | 311·8445 | ,, ,, |
| | 4375 | or | 10 | = | 283·495 | ,, ,, |
| | 3937·5 | or | 9 | = | 255·1455 | ,, ,, |
| | 3500 | or | 8 | = | 226·796 | ,, ,, |
| | 3062·5 | or | 7 | = | 198·4465 | ,, ,, |
| | 2625 | or | 6 | = | 170·097 | ,, ,, |
| | 2187·5 | or | 5 | = | 141·7475 | ,, ,, |
| | 1750 | or | 4 | = | 113·398 | ,, ,, |
| | 1312·5 | or | 3 | = | 85·0485 | ,, ,, |
| | 875 | or | 2 | = | 56·699 | ,, ,, |
| 1 ounce, | 437·5 | or | 1 | = | 28·3495 | ,, ,, |
| | 218·75 | or | $\frac{1}{2}$ | = | 14·17475 | ,, ,, |
| | 109·37 | or | $\frac{1}{4}$ | = | 7·087375 | ,, ,, |
| | 15·4323 | | | = | 1 | |
| | 1·543 | | | = | ·1, a decigramme. | |
| 1 grain, | 1 | | | = | ·0648 gramme. | |
| | ·15 or $\frac{2}{13}$ nearly | | | = | ·01, a centigramme. | |
| | ·015 or $\frac{1}{65}$ nearly | | | = | ·001, a milligramme (nearly). | |

## MEASURES, EQUIVALENTS OF FRENCH GRAMMES TO ENGLISH WEIGHTS.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 Litre = | 1 kilogramme, | 1000 French grammes | = | 35 ounces | and 120 | grains. |
| | | 900 | = | 31 | and $326\frac{3}{4}$ | ,, |
| | | 800 | = | 28 | and 96 | ,, |
| | | 700 | = | 24 | and $302\frac{3}{4}$ | ,, |
| | | 600 | = | 21 | and 72 | ,, |
| | | 500 | = | 17 | and $278\frac{3}{4}$ | ,, |
| | | 400 | = | 14 | and 48 | ,, |
| | | 300 | = | 10 | and $254\frac{3}{4}$ | ,, |
| | | 200 | = | 7 | and 24 | ,, |
| 1 Decilitre = | 1 hectogramme, | 100 | = | 3 | and $230\frac{3}{4}$ | ,, |
| | | 90 | = | 3 | and $76\frac{1}{3}$ | ,, |
| | | 80 | = | 2 | and $359\frac{1}{2}$ | ,, |
| | | 70 | = | 2 | and $205\frac{1}{3}$ | ,, |
| | | 60 | = | 2 | and 51 | ,, |
| | | 50 | = | 1 | and 334 | ,, |
| | | 40 | = | 1 | and $179\frac{3}{4}$ | ,, |
| | | 30 | = | 1 | and $25\frac{1}{2}$ | ,, |
| | | 20 | = | | $308\frac{2}{3}$ | ,, |
| 1 Centilitre = | 1 decagramme, | 10 | = | | $154\frac{1}{3}$ | ,, |
| | | 5 | = | | $77\frac{1}{6}$ | ,, |
| 1 Millilitre = | *1 gramme, | 1 | = | nearly | $15\frac{1}{2}$ | ,, |
| | | ·5 | = | ,, | $7\frac{3}{4}$ | ,, |
| | 1 decigramme, | ·1 | = | ,, | $1\frac{1}{2}$ | ,, |
| | | ·05 | = | ,, | $\frac{3}{4}$ | ,, |
| | 1 centigramme, | ·01 | = | ,, | $\frac{2}{13}$ | ,, |
| | | ·005 | = | ,, | $\frac{1}{13}$ | ,, |
| | 1 milligramme, | ·001 | = | ,, | $\frac{1}{65}$ | ,, |

---

* The weight of a cubic centimetre of water at its greatest density, viz. at the temperature of 4° C. or 39·2° F.

NOTE.—On the Continent liquids are weighed not measured.

# METRICAL MEASURES.

## RELATION OF THE METRICAL MEASURES TO THE MEASURES OF THE BRITISH PHARMACOPŒIA.

1 Millimetre = 0·03937 inch.
1 Centimetre = 0·39371 „
1 Decimetre = 3·93708 inches.
1 Metre = 39·37079 „

1 Cubic Centimetre = 15·43235 grain-measures.
1 Litre = $35\frac{1}{4}$ fl. oz. and 11 mins. or 15432·348 grain-measures.

## LENGTH.

1 Millimetre = the thousandth part of one metre, or 0·001 metre.
1 Centimetre = the hundredth „ 0·01 „
1 Decimetre = the tenth part „ 0·1 „
1 Metre = the ten-millionth part of a quarter of the circumference of the earth = 39·37079 inches.

1 Line = $\frac{1}{12}$ inch.
1 Inch = $\frac{1}{12}$ foot.
12 Inches = 1 foot.
36 „ = 3 feet = 1 yard.
Length of pendulum vibrating seconds of mean time in the latitude of London, in a vacuum at the level of the sea . } 39·1393 inches.

It is remarkable that the English and French standards, taken from such different sources, should so nearly agree:—

The English, from the length of a pendulum vibrating seconds of mean time; from which the yard (36 inches) is computed . . } 39·1393.

The French being the ten-millionth part of a quarter of the earth's meridian, and called a metre . . . . . . . . . . } 39·37079.

## CAPACITY.

1 Millilitre = 1 cubic centimetre, or the measure of 1 gramme of water.
1 Centilitre = 10 „ centimetres „ 10 grammes „
1 Decilitre = 100 „ „ „ 100 „ „
1 Litre = 1000 „ „ „ 1000 „ (1 kilo.)

## TABLE OF COMPARISON OF THE FAHRENHEIT WITH THE CENTIGRADE* AND RÉAUMUR'S THERMOMETER.

| Fahr. | Cent. | Réau | Fahr. | Cent. | Réau. | Fahr. | Cent. | Réau. |
|---|---|---|---|---|---|---|---|---|
| 212 | 100 | 80 | 136·4 | 58 | 46·4 | 60·8 | 16 | 12·8 |
| 210·2 | 99 | 79·2 | 134·6 | 57 | 45·6 | 59 | 15 | 12 |
| 208·4 | 98 | 78·4 | 132·8 | 56 | 44·8 | 57·2 | 14 | 11·2 |
| 206·6 | 97 | 77·6 | 131 | 55 | 44 | 55·4 | 13 | 10·4 |
| 204·8 | 96 | 76·8 | 129·2 | 54 | 43·2 | 53·6 | 12 | 9·6 |
| 203 | 95 | 76 | 127·4 | 53 | 42·4 | 51·8 | 11 | 8·8 |
| 201·2 | 94 | 75·2 | 125·6 | 52 | 41·6 | 50 | 10 | 8 |
| 199·4 | 93 | 74·4 | 123·8 | 51 | 40·8 | 48·2 | 9 | 7·2 |
| 197·6 | 92 | 73·6 | 122 | 50 | 40 | 46·4 | 8 | 6·4 |
| 195·8 | 91 | 72·8 | 120·2 | 49 | 39·2 | 44·6 | 7 | 5·6 |
| 194 | 90 | 72 | 118·4 | 48 | 38·4 | 42·8 | 6 | 4·8 |
| 192·2 | 89 | 71·2 | 116·6 | 47 | 37·6 | 41 | 5 | 4 |
| 190·4 | 88 | 70·4 | 114·8 | 46 | 36·8 | 39·2 | 4 | 3·2 |
| 188·6 | 87 | 69·6 | 113 | 45 | 36 | 37·4 | 3 | 2·4 |
| 186·8 | 86 | 68·8 | 111·2 | 44 | 35·2 | 35·6 | 2 | 1·6 |
| 185 | 85 | 68 | 109·4 | 43 | 34·4 | 33·8 | 1 | 0·8 |
| 183·2 | 84 | 67·2 | 107·6 | 42 | 33·6 | 32 | 0 | 0 |
| 181·4 | 83 | 66·4 | 105·8 | 41 | 32·8 | 30·2 | — 1 | — 0·8 |
| 179·6 | 82 | 65·6 | 104 | 40 | 32 | 28·4 | — 2 | — 1·6 |
| 177·8 | 81 | 64·8 | 102·2 | 39 | 31·2 | 26·6 | — 3 | — 2·4 |
| 176 | 80 | 64 | 100·4 | 38 | 30·4 | 24·8 | — 4 | — 3·2 |
| 174·2 | 79 | 63·2 | 98·6 | 37 | 29·6 | 23 | — 5 | — 4 |
| 172·4 | 78 | 62·4 | 96·8 | 36 | 28·8 | 21·2 | — 6 | — 4·8 |
| 170·6 | 77 | 61·6 | 95 | 35 | 28 | 19·4 | — 7 | — 5·6 |
| 168·8 | 76 | 60·8 | 93·2 | 34 | 27·2 | 17·6 | — 8 | — 6·4 |
| 167 | 75 | 60 | 91·4 | 33 | 26·4 | 15·8 | — 9 | — 7·2 |
| 165·2 | 74 | 59·2 | 89·6 | 32 | 25·6 | 14 | —10 | — 8 |
| 163·4 | 73 | 58·4 | 87·8 | 31 | 24·8 | 12·2 | —11 | — 8·8 |
| 161·6 | 72 | 57·6 | 86 | 30 | 24 | 10·4 | —12 | — 9·6 |
| 159·8 | 71 | 56·8 | 84·2 | 29 | 23·2 | 8·6 | —13 | —10·4 |
| 158 | 70 | 56 | 82·4 | 28 | 22·4 | 6·8 | —14 | —11·2 |
| 156·2 | 69 | 55·2 | 80·6 | 27 | 21·6 | 5 | —15 | —12 |
| 154·4 | 68 | 54·4 | 78·8 | 26 | 20·8 | 3·2 | —16 | —12·8 |
| 152·6 | 67 | 53·6 | 77 | 25 | 20 | 1·4 | —17 | —13·6 |
| 150·8 | 66 | 52·8 | 75·2 | 24 | 19·2 | — 0·4 | —18 | —14·4 |
| 149 | 65 | 52 | 73·4 | 23 | 18·4 | — 2·2 | —19 | —15·2 |
| 147·2 | 64 | 51·2 | 71·6 | 22 | 17·6 | — 4 | —20 | —16 |
| 145·4 | 63 | 50·4 | 69·8 | 21 | 16·8 | — 5·8 | —21 | —16·8 |
| 143·6 | 62 | 49·6 | 68 | 20 | 16 | — 7·6 | —22 | —17·6 |
| 141·8 | 61 | 48·8 | 66·2 | 19 | 15·2 | — 9·4 | —23 | —18·4 |
| 140 | 60 | 48 | 64·4 | 18 | 14·4 | —11·2 | —24 | —19·2 |
| 138·2 | 59 | 47·2 | 62·6 | 17 | 13·6 | —13 | —25 | —20 |

Reductions from one scale to another are easily made by the following calculation:—

Fahrenheit to Centigrade, deduct 32°, multiply by 5, and divide by 9.
Centigrade to Fahrenheit, multiply by 9, divide by 5, and add 32°.
Réaumur to Fahrenheit, multiply by 9, divide by 4, and add 32°.

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* Celsius first proposed this scale, which is also called "Celsius."

## ALCOHOL TABLE.

| Specific Gravity at 60° F. (15·6° C.). | Absolute Alcohol by weight. Per cent. | Absolute Alcohol by volume. Per cent. | Specific Gravity at 60° F. (15·6° C.). | Absolute Alcohol by weight. Per cent. | Absolute Alcohol by volume. Per cent. |
|---|---|---|---|---|---|
| 1·000 | 0·00 | 0·00 | ·894 | 60·67 | 68·33 |
| ·998 | 1·06 | 1·34 | ·892 | 61·50 | 69·11 |
| ·996 | 2·28 | 2·86 | ·890 | 62·36 | 69·92 |
| ·994 | 3·41 | 4·27 | ·888 | 63·26 | 70·77 |
| ·992 | 4·62 | 5·78 | ·886 | 64·13 | 71·58 |
| ·990 | 5·87 | 7·32 | ·884 | 65·00 | 72·38 |
| ·988 | 7·27 | 9·04 | ·882 | 65·83 | 73·15 |
| ·986 | 8·64 | 10·73 | ·880 | 66·70 | 73·93 |
| ·984 | 10·08 | 12·49 | ·878 | 67·54 | 74·70 |
| ·982 | 11·62 | 14·37 | ·876 | 68·38 | 75·45 |
| ·980 | 13·15 | 16·24 | ·874 | 69·21 | 76·20 |
| ·978 | 14·82 | 18·25 | ·872 | 70·04 | 76·94 |
| ·976 | 16·46 | 20·24 | ·870 | 70·84 | 77·64 |
| ·974 | 18·08 | 22·18 | ·868 | 71·67 | 78·36 |
| ·972 | 19·67 | 24·08 | ·866 | 72·52 | 79·12 |
| ·970 | 21·31 | 26·04 | ·864 | 73·38 | 79·86 |
| ·968 | 22·85 | 27·86 | ·862 | 74·23 | 80·60 |
| ·966 | 24·38 | 29·67 | ·860 | 75·14 | 81·40 |
| ·964 | 25·86 | 31·40 | ·858 | 76·04 | 82·19 |
| ·962 | 27·21 | 32·98 | ·856 | 76·88 | 82·90 |
| ·960 | 28·56 | 34·54 | ·854 | 77·71 | 83·60 |
| ·958 | 29·87 | 36·04 | ·852 | 78·52 | 84·27 |
| ·956 | 31·00 | 37·34 | ·850 | 79·32 | 84·93 |
| ·954 | 32·25 | 38·75 | ·848 | 80·13 | 85·59 |
| ·952 | 33·47 | 40·14 | ·846 | 80·96 | 86·28 |
| ·950 | 34·52 | 41·32 | ·844 | 81·76 | 86·93 |
| ·948 | 35·50 | 42·40 | ·842 | 82·54 | 87·55 |
| ·946 | 36·56 | 43·56 | ·840 | 83·31 | 88·16 |
| ·944 | 37·67 | 44·79 | ·838 | 84·08 | 88·76 |
| ·942 | 38·78 | 46·02 | ·836 | 84·88 | 89·38 |
| ·940 | 39·80 | 47·13 | ·834 | 85·65 | 89·99 |
| ·938 | 40·80 | 48·21 | ·832 | 86·42 | 90·58 |
| ·936 | 41·80 | 49·29 | ·830 | 87·19 | 91·17 |
| ·934 | 42·76 | 50·31 | ·828 | 87·96 | 91·75 |
| ·932 | 43·71 | 52·32 | ·826 | 88·76 | 92·36 |
| ·930 | 44·64 | 52·29 | ·824 | 89·54 | 92·24 |
| ·928 | 45·55 | 53·24 | ·822 | 90·29 | 93·49 |
| ·926 | 46·46 | 54·19 | ·820 | 91·00 | 94·00 |
| ·924 | 47·36 | 55·13 | ·818 | 91·71 | 94·51 |
| ·922 | 48·27 | 56·07 | ·816 | 92·44 | 95·03 |
| ·920 | 49·16 | 56·98 | ·814 | 93·18 | 95·55 |
| ·918 | 50·09 | 58·92 | ·812 | 93·92 | 96·08 |
| ·916 | 50·96 | 58·80 | ·810 | 94·62 | 96·55 |
| ·914 | 51·79 | 59·63 | ·808 | 95·32 | 97·02 |
| ·912 | 52·68 | 60·52 | ·806 | 96·03 | 97·51 |
| ·910 | 53·57 | 61·40 | ·804 | 96·70 | 97·94 |
| ·908 | 54·48 | 62·31 | ·802 | 97·37 | 98·37 |
| ·906 | 55·41 | 63·24 | ·800 | 98·03 | 98·80 |
| ·904 | 56·32 | 64·14 | ·798 | 98·66 | 99·16 |
| ·902 | 57·21 | 65·01 | ·796 | 99·29 | 99·55 |
| ·900 | 58·05 | 65·81 | ·794 | 99·94 | 99·96 |
| ·898 | 58·95 | 66·69 | ·7938 | 100·00 | 100·00 |
| ·896 | 59·83 | 67·53 | | | |

## BEAUMÉ'S HYDROMETER COMPARED WITH THE SPECIFIC GRAVITY OF LIQUIDS HEAVIER THAN WATER.

### 1·000 BEING TAKEN AS THE SPECIFIC GRAVITY OF DISTILLED WATER AT 15·5° CENTIGRADE = 60° FAHRENHEIT.

| Beaumé. | Sp. G. | Beaumé. | Sp. G. |
|---|---|---|---|
| 0 | 1·000 | 39 | 1·367 |
| 1 | 1·007 | 40 | 1·380 |
| 2 | 1·014 | 41 | 1·394 |
| 3 | 1·021 | 42 | 1·407 |
| 4 | 1·028 | 43 | 1·421 |
| 5 | 1·036 | 44 | 1·435 |
| 6 | 1·043 | 45 | 1·449 |
| 7 | 1·051 | 46 | 1·464 |
| 8 | 1·058 | 47 | 1·479 |
| 9 | 1·066 | 48 | 1·494 |
| 10 | 1·074 | 49 | 1·510 |
| 11 | 1·082 | 50 | 1·526 |
| 12 | 1·090 | 51 | 1·542 |
| 13 | 1·098 | 52 | 1·558 |
| 14 | 1·107 | 53 | 1·575 |
| 15 | 1·115 | 54 | 1·593 |
| 16 | 1·124 | 55 | 1·610 |
| 17 | 1·133 | 56 | 1·628 |
| 18 | 1·142 | 57 | 1·647 |
| 19 | 1·151 | 58 | 1·666 |
| 20 | 1·160 | 59 | 1·685 |
| 21 | 1·169 | 60 | 1·705 |
| 22 | 1·179 | 61 | 1·725 |
| 23 | 1·188 | 62 | 1·746 |
| 24 | 1·198 | 63 | 1·767 |
| 25 | 1·208 | 64 | 1·789 |
| 26 | 1·218 | 65 | 1·811 |
| 27 | 1·229 | 66 | 1·834 |
| 28 | 1·239 | 67 | 1·857 |
| 29 | 1·250 | 68 | 1·882 |
| 30 | 1·261 | 69 | 1·906 |
| 31 | 1·272 | 70 | 1·932 |
| 32 | 1·283 | 71 | 1·958 |
| 33 | 1·294 | 72 | 1·984 |
| 34 | 1·306 | 73 | 2·011 |
| 35 | 1·318 | 74 | 2·040 |
| 36 | 1·330 | 75 | 2·069 |
| 37 | 1·342 | 76 | 2·099 |
| 38 | 1·355 | 77 | 2·130 |

Specific Gravity of Syrups, &c., may be tested with a ten-ounce measure. Ten measured ounces of simple syrup should weigh nearly thirteen ounces and one-third, representing the sp. g. 1·330.

In the formulas for the Syrups of the British Pharmacopœia some of them are directed to be made to a given weight, and the specific gravity is also stated. It can be easily ascertained what any of these weights would measure, by dividing the weight by the specific gravity; thus Syrupus Aurantii Floris is directed to weigh 72 oz., and the specific gravity to be 1·330, then 72·000 ÷ 1·330 = 54, or 54 ounces by measure.

# MATERIA MEDICA TABLE

| B. P. Name. | Obtained from. | Natural Order. | Geographical Source. |
|---|---|---|---|
| Acaciæ Gummi | Acacia Senegal, and other species | Leguminosæ | Kordofan, in Eastern Africa |
| Aconiti Folia | Aconitum Napellus | Ranunculaceæ | Britain |
| Aconiti Radix | ,, ,, | ,, | ,, or Germany |
| Aconitina | ,, ,, | ,, | ,, ,, |
| Adeps Lanæ | Ovis Aries | Ruminantia | Domesticated everywhere |
| Adeps Præparatus | Sus scrofa | Pachydermata | Domesticated everywhere |
| Aloe Barbadensis | Aloe vulgaris | Liliaceæ | Barbadoes and Dutch West Indian Islands |
| Aloe Socotrina | Aloe Perryi and other species | Liliaceæ | Socotra (shipped by way of Bombay and Zanzibar) |
| Ammoniacum | Dorema Ammoniacum | Umbelliferæ | Persia |
| Amygdala Amara | Prunus Amygdalus (amara) | Rosaceæ | Morocco (Mogadore) |
| Amygdala Dulcis | Prunus Amygdalus (dulcis) | ,, | Spain, Portugal, and south of France |
| Amygdalæ Oleum | Both of the above | ,, | ,, ,, ,, |
| Amylum | Triticum Sativum (wheat)<br>Zea Mays (maize)<br>Oryza Sativa (rice) | Graminaceæ | Cultivated in various parts of the world |
| Anethi Fructus | Peucedanum graveolens | Umbelliferæ | England, middle and southern Europe |
| Anisi Fructus | Pimpinella Anisum | Umbelliferæ | Southern Europe |
| Anisi Stellati Fructus | Illicium Anisatum | Magnoliaceæ | China |
| Anisi Oleum | Both the above | . . . . . . . | Distilled in Europe and in China |
| Anthemidis Flores | Anthemis nobilis | Compositæ | Britain, cultivated |
| Apomorphinæ Hydrochloras | Morphina or Codeina | *see* Opium. | *see* Opium |
| Armoraciæ Radix | Cochlearia Armoracia | Cruciferæ | Britain |
| Arnicæ Rhizoma | Arnica montana | Compositæ | Mountainous parts of middle and southern Europe |
| Asafœtida | Ferula Narthex, F. Scorodosma, and probably other species | Umbelliferæ | Afghanistan and Punjaub |
| Atropina | Belladonnæ Radix | Atropaceæ | . . . . . . . . . . . |
| Aurantii Floris Aqua | Citrus vulgaris, and C. aurantium | Aurantiaceæ | South of Europe |
| Aurantii Cortex | Citrus vulgaris | ,, | ,, |
| Aurantii Fructus | ,, ,, | ,, | ,, |
| Balsamum Peruvianum | Myroxylon Pereiræ | Leguminosæ | Salvador, in Central America |

# OF THE ORGANIC KINGDOM.

| Parts used. | Preparations into which it enters. |
|---|---|
| Gum (exuded from stem & branches) | Mist. Cretæ; Mist. Guaiaci; Mucilago Acaciæ; Pulv. Amygdalæ Co. and Pulv. Tragacanth Co. All Trochisci. |
| Fresh leaves and flowering tops | Extractum Aconiti. |
| Dried root | Linimentum, and Tinctura Aconiti, and Aconitina. |
| ,, ,, | Unguentum Aconitinæ. |
| The purified cholesterin-fat of sheep's wool | Adeps Lanæ Hydrosus, from which is made Ung. Conii. |
| Internal fat of the abdomen | Adeps Benzoatus; Empl. Canthar.; Unguenta Hydrargyri, Hydrarg. Nitratis, Iodi, and Terebinthinæ. |
| Inspissated juice of the leaf | Aloin; Enema Aloes; Ext. Aloes Barb.; Pil. Aloes Barb.; Pil. Aloes et Ferri; Pil. Cambogiæ Comp.; Pil. Colocynthidis Co.; Pil. Colocynthidis et Hyoscyami. |
| Inspissated juice of the leaf | Aloin; Decoct. Aloes Co.; Enema Aloes; Ext. Aloes Socotrinæ; Ext. Coloc. Co.; Pil. Aloes et Asafœtidæ; Pil. Aloes et Myrrhæ; Pil. Aloes Socot.; Pil. Rhei Co.; Tinct. Aloes; Tinct. Benzoini Co.; Vinum Aloes. |
| Gum-resinous exudation from stem | Emplastrum Ammoniaci c. Hydrargyro; Emplast. Galbani; Mistura Ammoniaci; Pilula Scillæ Co.; Pil. Ipecac. c. Scillâ. |
| Ripe seed | Oleum Amygdalæ. |
| Ripe seed | Oleum Amygdalæ; Pulvis Amygdalæ Compositus; Mistura Amygdalæ. |
| Expressed oil from seeds | Ol. Phosphoratum; Unguenta Cetacei, Resinæ, and Simplex. |
| tarch | Glycerinum Amyli; Mucilago Amyli; Enemata Aloes, Mag. Sulph., Opii, and Terebinthinæ; Pulvis Tragacanth. Co.; Suppos. Acid Carbol. c. Sapone; Suppos. Acid Tannici c. Sapone; Suppos. Morphinæ c. Sapone. |
| Dried fruit | Aqua Anethi; Oleum Anethi. |
| Dried fruit | Aqua Anisi; Oleum Anisi. |
| ,, ,, | Oleum Anisi. |
| Oil distilled from fruits | Ess. Anisi; Tinct. Camph. Co.; Tinct. Opii Ammoniata. |
| Single and double flower-heads or capitula (dried) | Extractum, Infusum, and Oleum Anthemidis. The latter is also in the preparation of the Extract. |
| alt of the alkaloid | Injectio Apomorphinæ Hypodermica. |
| resh root | Spiritus Armoraciæ Compositus. |
| ried rhizome and rootlets | Tinctura Arnicæ. |
| um-resin | Enema Asafœtidæ; Pil. Aloes et Asafœtidæ; Pil. Asafœtidæ Co.; Spiritus Ammoniæ Fœtidus; Tinctura Asafœtidæ. |
| lkaloid | Unguentum Atropinæ, Atropinæ Sulphas, Lamellæ Atropinæ and Liquor Atropinæ Sulphatis. |
| istilled water of flowers | Syrupus Aurantii Floris. |
| ried outer part of the rind | Inf. Aurantii, Inf. Aurantii Comp.; Inf. Gentian. Comp.; Tinct. Aurantii; Tinct. Cinchon. Comp.; Tinct. Gentian. Comp.; Spirit. Armoraciæ Comp.; also with Tinctura Aurantii are made: Mist. Ferri Aromatica, Syrupus Aurantii, and Tinct. Quininæ. |
| ipe fruit | Tinct. Aurantii Recentis, Vinum Aurantii. |
| alsam, from the trunk. | |

| B. P. Name. | Obtained from. | Natural Order. | Geographical Source. |
|---|---|---|---|
| Balsamum Tolutanum | Myroxylon Toluifera | Leguminosæ | New Granada |
| Belæ Fructus | Ægle Marmelos | Aurantiaceæ | Malabar and Coromandel |
| Belladonnæ Folia | Atropa Belladonna | Atropaceæ | Britain |
| Belladonnæ Radix | ,, ,, | ,, | Britain or Germany |
| Benzoinum | Styrax Benzoin and other species | Styraceæ | Siam and Sumatra |
| Buchu Folia | Barosma betulina<br>Barosma crenulata<br>Barosma serratifolia | Rutaceæ | Cape of Good Hope |
| Cadinum Oleum | Juniperus Oxycedrus and other species | Coniferæ | Southern Europe |
| Caffeina | Camellia Thea<br>Coffea Arabica | Ternstromiaceæ<br>Cinchonaceæ | China, Japan, and Upper India.<br>Cultivated throughout the tropics (native of Abyssinia) |
| Cajuputi Oleum | Melaleuca minor | Myrtaceæ | Imported from Batavia and Singapore |
| Calumbæ Radix | Jateorhiza Calumba | Menispermaceæ | Eastern Africa, between Ibo and the Zambesi |
| Cambogia | Garcinia Hanburii | Guttiferæ | Siam |
| Camphora | Cinnamomum Camphora | Lauraceæ | China (Formosa) and Japan (purified in Britain) |
| Canellæ Cortex | Canella alba | Canellaceæ | West Indies |
| Cannabis Indica | Cannabis sativa | Cannabinaceæ | India |
| Cantharis | Cantharis vesicatoria | Coleoptera | Hungary and Southern Russia |
| Capsici Fructus | Capsicum fastigiatum | Solanaceæ | Zanzibar |
| Cardamomi Semina | Elettaria Cardamomum | Zingiberaceæ | Malabar |
| Carui Fructus | Carum Carui | Umbelliferæ | England and Germany |
| Caryophyllum | Eugenia Caryophyllata | Myrtaceæ | Zanzibar and Pemba |
| Cascara Sagrada | Rhamnus Purshianus | Rhamnaceæ | California |
| Cascarillæ Cortex | Croton Eluteria | Euphorbiaceæ | Bahama Islands |
| Cassiæ Pulpa | Cassia Fistula | Leguminosæ | East and West Indies |
| Catechu | Uncaria Gambier | Cinchonaceæ | Singapore, and other places in the Eastern Archipelago |
| Cera Flava | Apis mellifica | Hymenoptera | Indigenous |
| Cerevisiæ Fermentum | Saccharomyces Cerevisiæ | Fungi | . . . . . . . . . . |
| Cetaceum | Physeter macrocephalus | Cetacea | Pacific and Indian Oceans |

| Parts used. | Preparations into which it enters. |
|---|---|
| Balsam, from the trunk | Syrupus Tolutanus; Tinct. Tolutana; Pil. Phosphori; Tinct. Benzoini Co. |
| Dried half-ripe fruit | Extractum Belæ Liquidum. |
| Leaves, with or without branches | Fresh leaves and branches = Extract. Belladonnæ; Succus Belladonnæ; Dried leaves = Tinct. Belladonnæ. |
| Dried root | Atropina; Extract. Belladonnæ Alcoholicum; Linimentum Belladonnæ. |
| Balsamic resin | Acidum Benzoicum; Adeps Benzoatus (and Ointments containing it); Tinct. Benzoini Co.; Ung. Cetacei. |
| Dried leaves | Infusum Buchu, Tinctura Buchu. |
| An empyreumatic oily liquid obtained by destructive distillation of the wood | |
| Alkaloid from leaves of tea or seeds of coffee | Caffeinæ Citras. |
| Oil distilled from the leaves | Spiritus Cajuputi, Lin. Crotonis. |
| Dried root | Extractum, Infusum, and Tinct. Calumbæ; Mist. Ferri Aromat. |
| Gum-resin | Pilula Cambogiæ Composita. |
| A stearoptene obtained from the wood | Aqua Camph.; Linimenta Aconiti, Belladonnæ, Camph., Camph. Co., Chloroformi, Hydrargyri, Opii, Saponis, Sinapis Comp., Terebinthinæ, and Tereb. Aceticum; Spiritus Camph.; Tinct. Camph. Co.; Ung. Hydrarg. Co. |
| Dried bark deprived of its corky layer | Vinum Rhei. |
| Dried flowering or fruiting tops of female plants | Extractum Cannabis Ind.; Tinctura Cannab. Ind. |
| The dried beetle | Acetum, Emplastrum, Tinctura and Unguentum Cantharidis; Charta Epispastica; Liquor Epispast.; Emplast. Calefaciens. |
| Dried ripe fruit | Tinctura Capsici. |
| Seeds of the dried capsules | Tinct. Cardam. Co.; Ext. Coloc. Co.; Pulv. Cinnam. Co.; Pulv. Cretæ Arom.; Tinct. Gentian. Co.; Tinct. Rhei; Vinum Aloes. |
| Dried fruit | Aqua and Oleum Carui; Confectio Opii; Conf. Piperis; Pulvis Opii Compositus; Tinct. Cardam. Co.; Tinct. Sennæ. |
| Dried flower-buds | Infusum and Oleum Caryophylli; Inf. Aurant. Co.; Mist. Ferri Arom.; Vinum Opii. |
| Dried bark | Ext. Cascaræ Sagradæ; Ext. Cascar. Sagrad. Liquid. |
| Dried bark | Infusum and Tinctura Cascarillæ. |
| Pulp from the pods | Confectio Sennæ. |
| An extract of the leaves and young shoots | Infusum Catechu, Pulvis Catechu Comp., Tinctura Catechu, Trochisci Catechu. |
| Honeycomb | Emplast. Calefaciens, Cantharidis, Galbani, Picis, Saponis fuscum; Pil. Phosphori; Unguenta Cantharidis, Hydrarg. Co., Picis Liquid., Resinæ, Sabinæ, Terebinthinæ, Cera Alba:—Charta Epispastica, Unguenta Cetacei and Simplex. |
| Beer yeast | Cataplasma Fermenti. |
| A concrete fatty substance, mixed with oil, obtained from the head of the sperm whale, purified | Charta Epispastica; Unguentum Cetacei. |

| B. P. Name | Obtained from. | Natural Order. | Geographical Source. |
|---|---|---|---|
| Cetraria | Cetraria Islandica | Lichenes | North of Europe |
| Chirata | Ophelia Chirata | Gentianaceæ | Northern India |
| Chrysarobinum | Andira Araroba | Leguminosæ | Bahia (Brazil) |
| Cimicifugæ Rhizoma | Cimicifuga Racemosa | Ranunculaceæ | North America |
| Cinchonæ Cortex | Cinchona Calisaya<br>Cinchona succirubra<br>Cinchona lancifolia | Cinchonaceæ | South America, India, Ceylon, and Java |
| Cinchonæ Rubræ Cortex | Cinchona succirubra | Cinchonaceæ | South America, cultivated in East Indies |
| Cinnamomi Cortex | Cinnamomum Zeylanicum | Lauraceæ | Ceylon |
| Coca | Erythroxylon Coca | Erythroxylaceæ | Peru |
| CocainæHydrochloras | ,, ,, | ,, | ,, |
| Coccus | Coccus Cacti | Hemiptera | Mexico and Teneriffe |
| Colchici Cormus | Colchicum autumnale | Melanthaceæ | Indigenous |
| Colchici Semina | ,, ,, | ,, | ,, |
| Colocynthidis Pulpa | Citrullus Colocynthis | Cucurbitaceæ | Northern Africa, Syria, and Spain |
| Conii Folia | Conium maculatum | Umbelliferæ | Britain |
| Conii Fructus | ,, ,, | ,, | ,, |
| Copaiba | Copaifera Langsdorffii and other species | Leguminosæ | Valley of the Amazon |
| Coriandri Fructus | Coriandrum sativum | Umbelliferæ | Britain |
| Crocus | Crocus sativus | Iridaceæ | Spain, France, and Italy |
| Crotonis Oleum | Croton Tiglium | Euphorbiaceæ | Hindostan, Ceylon, and Indian Archipelago |
| Cubeba | Piper Cubeba | Piperaceæ | Java and Sumatra |
| Cuspariæ Cortex | Galipea Cusparia | Rutaceæ | Tropical South America |
| Cusso | Hagenia abyssinica | Rosaceæ | Abyssinia |
| Digitalis Folia | Digitalis purpurea | Scrophulariaceæ | Indigenous |
| Ecballii Fructus | Ecballium Elaterium | Cucurbitaceæ | Britain |
| Elemi | Referred to Canarium commune | Amyridaceæ | Manila |
| Ergota | Secale cereale | Graminaceæ | Europe |
| Eucalypti Oleum | Eucalyptus Globulus, Eucalyptus Amygdalina | Myrtaceæ | Australia |
| Eucalypti Gummi | Eucalyptus rostrata and other species | Myrtaceæ | Australia |
| Euonymi Cortex | Euonymus atropurpureus | Celastrineæ | United States |
| Farina Tritici | Triticum sativum | Graminaceæ | Britain |
| Fel Bovinum Purificatum | Bos Taurus | Ruminantia | Domesticated everywhere |
| Ficus | Ficus Carica | Moraceæ | Smyrna |
| Filix-Mas | Aspidium Filix-mas | Filices | Indigenous |
| Fœniculi Fructus | Fœniculum capillaceum | Umbelliferæ | Central and Southern Europe, also India and China |

| Parts used. | Preparations into which it enters. |
|---|---|
| The entire lichen dried | Decoctum Cetrariæ. |
| Entire plant | Infusum and Tinctura Chiratæ. |
| Medullary matter of stem and branches | Ung. Chrysarobini. |
| Dried rhizome and rootlets | Ext. Cimicifugæ Liquid ; Tinct. Cimicifugæ. |
| Dried bark | Cinchonidinæ Sulphas ; Cinchoninæ Sulphas ; Quininæ Hydrochloras ; Quininæ Sulphas. |
| Dried bark of stem and branches of cultivated plants | Decoct. Cinchonæ ; Ext. Cinchon. Liquid ; Inf. Cinchon. Acid ; Tinct. Cinchonæ ; Tinct. Cinchon. Comp. ; Mist. Ferri Ar. |
| The dried inner bark of shoots from the truncated stocks or stools | Aqua, Oleum, Pulvis Co., and Tinct. Cinnamomi ; Infusum, Pulvis Co., and Tinct. Catechu ; Decoct. Hæmatoxyli ; Pulv. Cretæ Arom. ; Pulv. Kino Co. ; Tinct. Cardam. Co. ; Tinct. Lavand. Co. ; Vinum Opii. |
| Dried leaves | Ext. Cocæ Liquid ; Cocainæ Hydrochloras. |
| Salt of the alkaloid | Lamellæ Cocainæ and Liquor Cocainæ Hydrochloratis. |
| Dried female insect | Tinctura Cocci ; Tinct. Cardam. Co. ; Tinct. Cinchonæ Co. |
| Fresh and dried corm | Extractum, Extractum Aceticum and Vinum Colchici. |
| Dried ripe seeds | Tinctura Colchici Seminum. |
| Dried peeled fruit freed from seeds | Extractum Coloc. Co. ; Pil. Coloc. Co. ; Pil. Coloc. et Hyoscyam. |
| Fresh leaves and young branches | Cataplasma, Extractum, Pilula Comp., and Succus Conii ; Unguentum Conii, and Vapor Coninæ (both from Succus). |
| Dried fruit | Tinctura Conii. |
| Oleo-resin | Oleum Copaibæ. |
| Dried ripe fruit | Oleum Coriandri ; Conf. Sennæ ; Syrupus et Tinct. Rhei ; Syrupus et Tinct. Sennæ. |
| The dried stigmas and top of the style | Tinctura Croci ; Decoct. Aloes Co. ; Pil. Aloes et Myrrh. ; Pulv. Cretæ Aromat. ; Tinct. Cinchon. Co. ; Tinct. Opii Ammon. ; Tinct. Rhei. |
| Expressed oil from the seeds | Linimentum Crotonis. |
| Dried unripe fruit | Oleum Cubebæ ; Oleo-resina Cubebæ ; Tinctura Cubebæ. |
| Dried bark | Infusum Cuspariæ. |
| Dried panicles | Infusum Cusso. |
| Dried leaf | Infusum and Tinctura Digitalis. |
| Nearly ripe fruit | Elaterium, Elaterinum, Pulvis Elaterini Compositus. |
| A concrete resinous exudation | Unguentum Elemi. |
| The sclerotium of *Claviceps purpurea*, produced within the paleæ of the common Rye (*Secale cereale*), and replacing the grain | Extractum Ergotæ Liquidum, Infusum Ergotæ, and Tinctura Ergotæ, Ergotinum, Inject. Ergotin. Hypoderm. |
| Distilled oil from the fresh leaves | Unguentum Eucalypti. |
| A ruby-coloured exudation. | |
| Dried root bark | Extractum Euonymi Siccum. |
| The grain of wheat ground and sifted | Cataplasma Fermenti. |
| The purified gall. | |
| Dried fruit | Confectio Sennæ. |
| Dried rhizome | Extractum Filicis Liquidum. |
| Dried fruit | Aqua Fœniculi ; Pulv. Glycyrrhizæ Co. |

| B. P. Name. | Obtained from. | Natural Order. | Geographical Source. |
|---|---|---|---|
| Galbanum | Ferula galbaniflua, Ferula rubricaulis, and probably other species | Umbelliferæ | Persia |
| Galla | Quercus lusitanica | Cupuliferæ | Asia Minor |
| Gelsemium | Gelsemium nitidum | Loganiaceæ | Southern part of the United States of America |
| Gentianæ Radix | Gentiana lutea | Gentianaceæ | Central and Southern Europe (mountains) |
| Glycyrrhizæ Radix | Glycyrrhiza glabra | Leguminosæ | England, France, Germany, and Spain |
| Gossypium | Gossypium barbadense and other species | Malvaceæ | Warm and tropical regions |
| Granati Radicis Cortex | Punica Granatum | Granateæ | Shores of the Mediterranean and Central Asia |
| Guaiaci Lignum<br>Guaiaci Resina | Guaiacum officinale or Guaiacum sanctum | Zygophyllaceæ | St. Domingo and Jamaica |
| Gutta Percha | Dichopsis Gutta and several other trees | Sapotaceæ | East Indian Islands |
| Hæmatoxyli Lignum | Hæmatoxylon Campechianum | Leguminosæ | Campeachy, Honduras, and Jamaica |
| Hamamelidis Cortex | Hamamelis virginica | Hamamelaceæ | United States |
| Hamamelidis Folia | Hamamelis virginica | Hamamelaceæ | United States |
| Hemidesmi Radix | Hemidesmus Indicus | Asclepiadaceæ | India |
| Hirudo | Sanguisuga medicinalis (speckled)<br>officinalis (green) | Sanguisuga | Spain, France, Italy, Hungary |
| Hordeum Decorticatum | Hordeum distichon | Graminaceæ | Britain |
| Hydrastis Rhizoma | Hydrastis canadensis | Ranunculaceæ | United States |
| Hyoscyami Folia | Hyoscyamus niger | Atropaceæ | Britain |
| Ipecacuanha | Cephaëlis Ipecacuanha | Cinchonaceæ | Brazil |
| Jaborandi | Pilocarpus pennatifolius | Rutaceæ | Pernambuco (Brazil) |
| Jalapa | Ipomœa Purga | Convolvulaceæ | Mexico |
| Juniperi Oleum | Juniperus communis | Coniferæ | North of Europe, indigenous |
| Kamala | Mallotus philippinensis | Euphorbiaceæ | India |
| Kino | Pterocarpus Marsupium | Leguminosæ | Malabar |
| Krameriæ Radix | Krameria triandra<br>Krameria Ixina | Polygalaceæ | Peru |
| Lac | Bos Taurus | Ruminantia | Domesticated everywhere |
| Lactuca | Lactuca virosa | Compositæ | Indigenous |
| Laricis Cortex | Pinus Larix | Coniferæ | Indigenous |
| Laurocerasi Folia | Prunus Laurocerasus | Rosaceæ | Britain |
| Lavandulæ Oleum | Lavandula vera | Labiatæ | England (also the western shores of the Mediterranean) |

| Parts used. | Preparations into which it enters. |
|---|---|
| um resin | Emplast. Galbani; Pil. Asafœtidæ Co. |
| Excrescences caused by the punctures and deposited ova of *Cynips Gallæ Tinctoriæ* | Acidum Gallicum and Tannicum; Tinct. Gallæ, Ung. Gallæ, and Ung. Gallæ c. Opio. |
| ried rhizome and rootlets | Extract. Gelsemii Alcoholicum; Tinct. Gelsemii. |
| ried root | Extractum, Infusum Co., and Tinct. Gentianæ Co. |
| Root and underground stem, fresh and dried | Extract., Ext. Liquid. and Pulv. Glycyrrh. Co.; Conf. Tereb. Dec. Sarsæ Co.; Inf. Lini; Pil. Hydr.; Pil. Ferri Iodid. |
| airs of the seed | Pyroxylin. |
| ried bark of the root | Decoctum Granati Radicis. |
| Heart-wood in chips | Decoct. Sarsæ Co. |
| Resin | Mist. Guaiaci; Pil. Hydrarg. Subchlor. Co.; Tinct. Guaiaci Ammon. |
| oncrete juice | Liquor Guttæ Perchæ. |
| liced heart-wood | Decoctum and Extractum Hæmatoxyli. |
| ried bark | Tinctura Hamamelidis. |
| ried leaves | Extractum Hamamelidis Liquidum; Unguentum Hamamelidis (from Liquid Extract). |
| ried root | Syrupus Hemidesmi. |
| eech. | |
| usked seeds | Decoctum Hordei. |
| ried rhizome and rootlets | Extractum Hydrastis Liquidum, Tinctura Hydrastis. |
| Fresh leaves and flowers, with branches | Extractum, Succus, and Pil. Coloc. et Hyoscyam. |
| Dried leaves and flowering tops | Tinctura Hyoscyami. |
| ried root | Acetum Ipecac.; Pil. Ipecac. c. Scillâ; Pulv. Ipecac. Co.; Trochisci Ipecac.; Trochisci Morphinæ et Ipecac.; Vinum Ipecac.; Pil. Conii Co. |
| ried leaflets | Extract., Infusum, and Tinct. Jaborandi; Pilocarpinæ Nitras. |
| ried tubercules | Extractum, Pulv. Co., Resina, and Tinctura Jalapæ; Pilula Scammonii Composita; Pulvis Scammonii Comp. |
| il from the unripe fruit | Spiritus Juniperi, and with it Mistura Creasoti. |
| Minute glands and hairs obtained from the surface of the fruits. | |
| nspissated juice from the trunk | Pulvis Compositus, Tinct. Kino; Pulv. Catechu Co. |
| ried root | Extractum, Infusum, Tinctura Krameriæ; Pulv. Catechu Co. |
| resh milk | Mistura Scammonii. |
| lowering herb | Extractum Lactucæ. |
| ried inner bark | Tinct. Laricis. |
| resh leaves | Aqua Laurocerasi. |
| istilled oil from flowers | Spiritus and Tinctura Lavandulæ Comp.; Lin. Camph. Co. |

| B. P. Name. | Obtained from. | Natural Order. | Geographical Source. |
|---|---|---|---|
| Limonis Cortex | Citrus Limonum | Aurantiaceæ | South of Europe |
| Limonis Succus | ,, ,, | ,, | ,, ,, |
| Lini Semina | Linum usitatissimum | Linaceæ | Britain |
| Lobelia | Lobelia inflata | Lobeliaceæ | North America |
| Lupulus | Humulus Lupulus | Cannabinaceæ | England |
| Manna | Fraxinus Ornus | Oleaceæ | Calabria and Sicily |
| Mastiche | Pistacia Lentiscus | Anacardiaceæ | Island of Scio |
| Maticæ Folia | Piper angustifolium | Piperaceæ | Northern part of South Americ |
| Mel | Apis mellifica | Hymenoptera | Universally domesticated |
| Menthæ piperitæ Oleum | Mentha piperita | Labiatæ | Britain |
| Menthæ viridis Oleum | Mentha viridis | Labiatæ | Britain |
| Menthol | Mentha Arvensis, var. piperascens and glabrata<br>Mentha Piperita | Labiatæ | China and Japan<br>United States |
| Mezerei Cortex | Daphne Mezereum<br>Laureola | Thymelaceæ | Mountainous parts of Europe |
| Mica Panis | Triticum sativum | Graminaceæ | Indigenous |
| Mori Succus | Morus nigra | Moraceæ | Cultivated in Britain; native of Persia and China |
| Morphinæ Acetas | Opium | *see* Opium. | *see* Opium |
| Morphinæ Hydrochloras | ,, | ,, | ,, |
| Morphinæ Sulphas | ,, | ,, | ,, |
| Morrhuæ Oleum | Gadus Morrhua | (Genus) Acipenser | Coasts of Norway, France, and England, Newfoundland and Labrador |
| Moschus | Moschus moschiferus | Ruminantia | Native of Central Asia; imported from China and India |
| Myristica | Myristica fragrans | Myristicaceæ | Banda Islands of the Malayan Archipelago |
| Myristicæ Oleum | ,, ,, | ,, | ,, |
| Myristicæ Oleum Expressum | ,, ,, | ,, | ,, |
| Myrrha | Balsamodendron Myrrha | Amyridaceæ | Arabia Felix and Abyssinia |
| Nectandræ Cortex | Nectandra Rodiæi | Lauraceæ | British Guiana |
| Nux Vomica | Strychnos Nux-vomica | Loganiaceæ | East Indies |
| Olivæ Oleum | Olea Europæa | Oleaceæ | South of Europe |
| Opium | Papaver somniferum | Papaveraceæ | Asia Minor (Smyrna) |
| Ovi Vitellus | Gallus Bankiva | (Class) Aves | Domesticated everywhere |
| Papaveris Capsulæ | Papaver somniferum | Papaveraceæ | Britain |
| Pareiræ Radix | Chondrodendron tomentosum | Menispermaceæ | Brazil |

| Parts used. | Preparations into which it enters. |
|---|---|
| Peel | Oleum, Syrupus, Tinctura Limonis; Inf. Aurant. Co.; Inf. Gentian. Co. |
| Juice | Syrupus Limonis. |
| Dried ripe seeds, entire and reduced to powder | Farina Lini, Infusum Lini, Oleum Lini. All Cataplasmata (except Fermenti) from Farina Lini. |
| Dried flowering herb | Tinctura Lobeliæ. Tinct. Lobeliæ Ætherea. |
| Dried strobiles | Extractum, Infusum, Tinctura Lupuli, Lupulinum. |
| Concrete saccharine exudation from the stem. | |
| Concrete resinous exudation from the stem and branches. | |
| Dried leaves | Infusum Maticæ. |
| Saccharine secretion in honeycomb | Mel depuratum; Mel Boracis; Oxymel; Oxymel Scillæ; Conf. Piper.; Conf. Scammon.; Conf. Terebinth. |
| Oil distilled in Britain | Aqua, Essentia, and Spiritus Menthæ Piperitæ; Pil. Rhei Co. Tinct. Chloroformi et Morphinæ. |
| Oil distilled in Britain | Aqua Menthæ Viridis. |
| Stearoptene of oil. | Emplastrum Menthol. |
| Dried bark | Extractum Mezerei Æthereum; Decoctum Sarsæ Compositum. |
| Crumb of bread of wheat flour | Cataplasma Carbonis. |
| Juice of ripe fruit | Syrupus Mori. |
| Salt of the alkaloid | Injectio Morphinæ Hypodermica, and Liquor Morphinæ Acetatis. |
| " " " | Liquor Morph. Hydrochlor., Suppos. Morph., also c̄. Sapone, Tinct. Chlorof. et Morph., Trochisci Morph., also et Ipecac. |
| " " " | Liquor Morphinæ Sulphatis. |
| Oil of fresh liver of the Cod. | |
| Dried secretion from the preputial follicles. | |
| Dried seed divested of its coat | Oleum, and Oleum Myristicæ Expressum; Pulv. Catechu Co.; Pulv. Cretæ Aromat.; Sp. Armoraciæ Co.; Tinct. Lavand. Co. |
| Oil distilled from seed | Pil. Aloes Socot., Spir. Ammon. Arom., Spir. Myristicæ. |
| Expressed oil from seed | Emplastra Calefaciens and Picis. |
| Gum-resin (from the stem) | Tinct. Myrrh.; Pil. Aloes et Myrrh.; Decoct. Aloes Co. Mist. Ferri Co.; Pil. Asafœtidæ Co.; Pil. Rhei Co. |
| Dried bark | Beberinæ Sulphas. |
| eeds | Extractum and Tinctura Nucis Vomicæ; Strychnina. |
| Expressed oil from the ripe fruit | Charta Epispastica; Emplastra Ammoniac. c. Hydrarg., Hydrarg, Picis, Plumbi, and Saponis Fuscum; Enema Mag. Sulph.; Linimenta Ammoniæ, Calcis, and Camphoræ; Sapo Durus and Mollis; Unguenta Cantharidis, Hydrarg. Comp., Hydrarg. Nitratis, and Veratrinæ. |
| Inspissated juice from unripe capsules | Preparations many. *Vide* Opium. |
| Yolk | Mistura Spiritûs Vini Gallici. |
| Nearly ripe dried capsules of White Poppy | Decoctum, Extractum, and Syrupus Papaveris. |
| Dried root | Decoctum, Extractum, and Extractum Pareiræ Liquidum. |

| B. P. Name. | Obtained from | Natural Order. | Geographical Source. |
|---|---|---|---|
| Pepsin | Sus scrofa<br>Ovis aries<br>Bos taurus | Pachydermata<br>Ruminantia<br>" | Domesticated everywhere |
| Physostigmatis Semen | Physostigma venenosum | Leguminosæ | Western Africa |
| Picrotoxinum | Anamirta paniculata | Menispermaceæ | Eastern India, and the Malayan Islands |
| Pimenta | Pimenta officinalis | Myrtaceæ | West Indies |
| Pini Sylvestris Oleum | Pinus sylvestris | Coniferæ | Scotland and Russia |
| Piper nigrum | Piper nigrum | Piperaceæ | East Indies |
| Pix Burgundica | Pinus Picea | Coniferæ | Germany |
| Pix liquida | Pinus sylvestris and other species | Coniferæ | Scotland, Russia, Denmark, and Norway |
| Podophylli Rhizoma | Podophyllum peltatum | Ranunculaceæ (*Berberideæ, Hanbury*) | North America |
| Prunum | Prunus domestica | Rosaceæ | South of France |
| Pterocarpi Lignum | Pterocarpus santalinus | Leguminosæ | Madras and Ceylon |
| Pyrethri Radix | Anacyclus Pyrethrum | Compositæ | Algeria |
| Quassiæ Lignum | Picræna excelsa | Simarubaceæ | Jamaica |
| Quercûs Cortex | Quercus Robur | Cupuliferæ | Britain |
| QuininæHydrochlor. | Cinchonæ Cortex | Cinchonaceæ | South America, India, Ceylon, and Java |
| Quininæ Sulphas | " " | " | |
| Resina | Various species of Pinus. | Coniferæ | America |
| Rhamni Frangulæ Cortex | Rhamnus Frangula | Rhamnaceæ | Europe |
| Rhamni Purshiani Cortex | *See* Cascara Sagrada. | | |
| Rhei Radix | Rheum palmatum, Rheum officinale, and probably other species | Polygonaceæ | Collected and prepared in China and Thibet |
| Rhœados Petala | Papaver Rhœas | Papaveraceæ | Indigenous |
| Ricini Oleum | Ricinus communis | Euphorbiaceæ | India |
| Rosæ Caninæ Fructus | Rosa canina, and other indigenous allied species | Rosaceæ | Indigenous |
| Rosæ Centifoliæ Petala | Rosa centifolia | | Britain |
| Rosæ Gallicæ Petala | Rosa Gallica | | Britain |
| Rosmarini Oleum | Rosmarinus officinalis. | Labiatæ | South of Europe, Asia Minor; cultivated in England |
| Rutæ Oleum | Ruta graveolens | Rutaceæ | South of Europe |
| Sabadilla | Schænocaulon officinale | Melanthaceæ | Mexico |
| Sabinæ Cacumina | Juniperus Sabina | Coniferæ | Britain |
| Saccharum Purificatum | Saccharum officinarum<br>Beta vulgaris | Graminaceæ<br>Chenopodiaceæ | West Indies<br>Europe |
| Saccharum Lactis | Bos Taurus | Ruminantia | Domesticated everywhere |
| Salicinum | Salix alba, and other species of Salix and various species of Populus | Salicaceæ | Temperate regions of the Northern Hemisphere |
| Sambuci Flores | Sambucus nigra. | Caprifoliaceæ | Indigenous |
| Santali Oleum | Santalum album | Santalaceæ | India |

| Parts used. | Preparations into which it enters. |
|---|---|
| Preparation of the mucous lining of the fresh and healthy stomach . . . . . . . | |
| Dried seed . . . . . . . . | Extractum Physostigmatis; Physostigmina, from which is prepared Lamellæ Physostigminæ. |
| Seeds . . . . . . . . . . | |
| Dried unripe fruits . . . . . | Aqua, Oleum Pimentæ. |
| Oil distilled from fresh leaves . . | Vapor Olei Pini Sylvestris. |
| Dried unripe fruits . . . . . . | Confectio Opii; Confectio Piperis, Pulv. Opii Co. |
| Resinous exudation from the stem | Emplastrum Ferri; Emplastrum Picis. |
| Bituminous liquid obtained from the wood . . . . . | Unguentum Picis Liquidæ. |
| Dried rhizome and rootlets . . . | Resina Podophylli, and from it Tinctura Podophylli. |
| Dried drupe of the plum . . . | Confectio Sennæ. |
| Heart-wood . . . . . . . . . | Tinctura Lavandulæ Composita. |
| Dried root . . . . . . . . . | Tinctura Pyrethri. |
| Wood . . . . . . . . . . . | Extractum, Infusum, and Tinctura Quassiæ. |
| Dried bark of smaller branches and young stems . . . . | Decoctum Quercûs. |
| Salt of the alkaloid . . . . . | Tinctura Quininæ. |
| ,, ,, ,, | Ferri et Quininæ Citras, Tinct. Quininæ Ammon. Vinum Quininæ |
| The residue left after the distillation of the Oil of Turpentine from the crude Oleo-resin. | Charta Epispastica, Emplastrum and Unguentum Resinæ. Ung. Terebinth., Emplastra Calefaciens, Cantharidis, Picis, Plumbi Iodidi, and Saponis. |
| Dried bark . . . . . . . . . | Ext. Rhamni Frangulæ; Ext. Rhamni Frangulæ Liquidum. |
| Dried root deprived of the bark . | Extractum Rhei, Infusum Rhei, Pilula Rhei Co., Pulvis Rhei Co., Syrupus Rhei, Tinctura Rhei, and Vinum Rhei. |
| Fresh petals . . . . . . . . | Syrupus Rhœados. |
| Oil expressed from the seeds . . | Collodium Flexile, Lin. Sinapis Comp., Mistura Olei Ricini, Pil. Hydrarg. Subchlor. Co. |
| Ripe fruit . . . . . . . . . | Confectio Rosæ Caninæ. |
| Fresh fully expanded petals. . . | Aqua Rosæ. |
| Fresh and dried unexpanded petals | Confectio and Syrupus Rosæ Gallicæ; Infusum Rosæ Acidum. |
| Oil distilled from the flowering tops | Spiritus Rosmarini; Lin. Saponis and Tinct. Lavand. Comp. |
| Oil distilled from fresh herb . . | |
| Dried ripe seeds freed from their pericarps . . . . | Veratrina. |
| Fresh and dried tops . . . . . | Oleum, Tinctura, and Unguentum Sabinæ. |
| Juice of the stem . . . . . .<br>Juice of the root . . . . . . | All Syrups and Lozenges, and several other preparations. |
| Whey of milk, evaporated . . . | Pulv. Elaterini Comp. |
| Crystalline glucoside obtained from the bark . . . . . | |
| Fresh flowers . . . . . . . . | Aqua Sambuci. |
| Volatile oil distilled from the wood | |

| B. P. Name. | Obtained from. | Natural Order. | Geographical Source. |
|---|---|---|---|
| Santonica | Artemisia maritima, var. Stechmanniana | Compositæ | Russia |
| Sarsæ Radix | Smilax officinalis | Smilaceæ | Native of Central America; imported from Jamaica |
| Sassafras Radix | Sassafras officinale | Lauraceæ | North America |
| Scammoniæ Radix | Convolvulus Scammonia | Convolvulaceæ | Syria and Asia Minor |
| Scammoniæ Resina | ,, ,, | ,, | ,, ,, ,, |
| Scammonium | ,, ,, | ,, | ,, ,, ,, |
| Scilla | Urginea Scilla | Liliaceæ | Mediterranean coasts |
| Scoparii Cacumina | Cytisus scoparius | Leguminosæ | Indigenous |
| Senegæ Radix | Polygala Senega | Polygalaceæ | North America |
| Senna Alexandrina | Cassia acutifolia | Leguminosæ | Soudan, imported from Alexandria |
| Senna Indica | Cassia angustifolia | Leguminosæ | Southern India |
| Serpentariæ Rhizoma | Aristolochia Serpentaria or Aristolochia reticulata | Aristolochiaceæ | Southern parts of North America |
| Sevum Præparatum | Ovis Aries | Ruminantia | Domesticated everywhere |
| Sinapis | Brassica alba<br>Brassica nigra | Cruciferæ | Indigenous |
| Staphisagriæ Semina | Delphinium Staphisagria | Ranunculaceæ | South of Europe |
| Stramonii Folia | Datura Stramonium | Atropaceæ | Britain |
| Stramonii Semina | ,, ,, | ,, | ,, |
| Strophanthus | Strophanthus hispidus | Apocynaceæ | Africa |
| Strychnina | Nux Vomica | Loganiaceæ | East Indies |
| Styrax præparatus | Liquidambar orientalis | Liquidambaraceæ | South-west of Asia Minor |
| Sumbul Radix | Ferula Sumbul | Umbelliferæ | Russia and India |
| Tabaci Folia | Nicotiana Tabacum | Atropaceæ | America |
| Tamarindus | Tamarindus indica | Leguminosæ | West Indies |
| Taraxaci Radix | Taraxacum officinale | Compositæ | Britain |
| Terebinthina Canadensis | Pinus balsamea | Coniferæ | Canada |
| Terebinthinæ Oleum | Pinus australis, Pinus Tæda, & sometimes from P. Pinaster and P. sylvestris | ,, | United States of America |
| Theobromatis Oleum | Theobroma Cacao | Sterculiaceæ | Central America |
| Theriaca | Saccharum officinarum | Graminaceæ | West Indies and elsewhere |
| Thus Americanum | Pinus Tæda<br>Pinus australis | Coniferæ | Southern States of North America |
| Thymol | Thymus vulgaris<br>Monarda punctata<br>Carum Ajowan | Labiatæ<br>Umbelliferæ | Largely produced in France |
| Tragacantha | Astragalus gummifer | Leguminosæ | Asia Minor |
| Uvæ | Vitis vinifera | Vitaceæ | Spain |
| Uvæ Ursi Folia | Arctostaphylos Uva-ursi | Ericaceæ | Indigenous |
| Valerianæ Rhizoma | Valeriana officinalis | Valerianaceæ | Britain |
| Veratrina | Cevadilla | Melanthaceæ | Mexico |
| Veratri Viridis Rhizoma | Veratrum viride | Melanthaceæ | United States and Canada |
| Zingiber | Zingiber officinale | Zingiberaceæ | West Indies and India |

| Parts used. | Preparations into which it enters. |
|---|---|
| Dried unexpanded flower-heads or capitula | Santoninum. |
| Dried root | Decoctum Sarsæ, Decoct. Sarsæ Co., Extractum Sarsæ Liquidum. |
| Dried root | Decoctum Sarsæ Co. |
| Dried root | Resina Scammoniæ. |
| Resin from root | Conf. Scam.; Pil. Scam. Co.; Pulv. Scam. Co.; Ext. Col. Co.; Pil. Col. Co.; Pil. Col. et Hyoscyam. |
| Gum-resin obtained from living root | Mist. Scammonii; Resina Scammoniæ. |
| Sliced and dried bulb | Acetum, Oxymel, Pilula Co., Syrupus and Tinctura Scillæ; Pil. Ipecac. c. Scillâ. |
| Fresh and dried tops | Decoct. Scoparii (from dried); Succus Scoparii (from fresh). |
| Dried root | Infusum and Tinctura Senegæ. |
| Dried leaflets | Confectio, Infusum, Mistura Co., Syrupus, and Tinctura Sennæ; Pulvis Glycyrrhizæ Compositus. |
| Dried leaflets | May be used in the place of Alexandrian Senna. |
| Dried rhizome and rootlets | Infusum and Tinctura Serpentariæ; Tinct. Cinchon. Co. |
| Internal fat of the abdomen | Emplastrum Cantharidis, Unguentum Hydrargyri. |
| Seeds of both mixed | Cataplasma, and Charta Sinapis, Oleum Sinapis (from Black Mustard only); Lin. Sinapis Co. from the Oil. |
| Dried ripe seeds | Unguentum Staphisagriæ. |
| Dried leaves | |
| Dried ripe seeds | Extractum and Tinctura Stramonii. |
| Ripe seeds freed from the awns | Tinctura Strophanthi. |
| The alkaloid | Liquor Strychninæ Hydrochloratis. |
| Balsam from the inner bark purified. | Tinctura Benzoini Composita. |
| Dried root | Tinctura Sumbul. |
| Dried leaves. | |
| Pulp of the fruit | Confectio Sennæ. |
| Fresh and dried roots | Decoctum, Extractum, Extractum Liquidum, Succus Taraxaci. |
| Turpentine from incised bark. | Charta Epispastica; Collodium Flexile. |
| Oil distilled from Turpentine | Confectio, Enema, Linimentum, Linimentum Aceticum, and Unguentum Terebinthinæ. |
| Concrete oil from ground seeds | Some Suppositoria. |
| Uncrystallizable residue of the refining of sugar | Various Pill-masses and Tinct. Chloroformi et Morphinæ. |
| Concrete Turpentine | Emplastrum Picis. |
| Stearoptene of the oils | |
| Gummy exudation from the stem | Mucilago, Glycerinum, Pilula Ferri, Pulv. Tragac. Co.; Conf. Opii; Conf. Sulphuris; Pulv. Opii Co. |
| Ripe fruit | Tinct. Cardam. Co.; Tinct. Sennæ. |
| Dried leaves | Infusum Uvæ Ursi. |
| Dried rhizome and rootlets | Infusum, Tinctura, Tinctura Valerianæ Ammoniata. |
| The alkaloid from Cevadilla | Unguentum Veratrinæ. |
| Dried rhizome and rootlets | Tinctura Veratri Viridis. |
| Scraped and dried rhizome | Syrupus, Tinctura, Tinctura Zingiberis Fortior. It is also used in some powders and other preparations. |

## ABBREVIATIONS.

*Allen.* = Allen's Organic Analysis.
*A.J.P.* = American Journal of Pharmacy.
*B.M.J.* = British Medical Journal.
*B.M.J.E.* = British Medical Journal Epitome.
*B.P.* = British Pharmacopœia, 1885, and Additions, 1890.
*B.P.C.* = British Pharmaceutical Conference (Unofficial Formulary).
*B.S.H.* = Pharmacopœia of British Hospital for Diseases of the Skin.
*Brunton.* = Lauder Brunton's Pharmacology.
*C.D.* = Chemist and Druggist.
*C.N.* = Chemical News.
*L.* = Lancet.
*L.M.R.* = London Medical Recorder.
*L.O.H.* = Pharmacopœia of the Royal London Ophthalmic Hospital (Moorfields).
*M.A.* = Medical Annual.
*M.T.* = Medical Times and Gazette.
*M.P.* = Medical Press and Circular.
*Murrell.* = What to do in cases of Poisoning (Murrell).
*P.J.* = Pharmaceutical Journal (Third Series).
*P.L.* = Pharmacopœia Londinensis, 1851.
*P.R.* = Pharmaceutical Record (New York).
*Pr.* = Practitioner.
*Ringer.* = Ringer's Handbook of Therapeutics.
*Squibb.* = Squibb's Ephemeris.
*Sutton.* = Sutton's Volumetric Analysis.
*T.G.* = Therapeutic Gazette (Philadelphia).
*T.H.* = Pharmacopœia of the Hospital for Diseases of the Throat (Golden Square).
*U.S.N.F.* = National Formulary of the American Pharmaceutical Association.
*Y.B.P.* = Year-book of Pharmacy.
*Y.B.T.* = Year-book of Treatment.

EXAMPLE : *B.M.J.* '84, i. 56, refers to British Medical Journal, 1884, Volume I., page 56.

The British, published in 1885, with Additions 1890, is in this work compared with the latest editions of the foreign Pharmacopœias, which are as follows :—

| | | | |
|---|---|---|---|
| Austrian . . | published in 1889 | Norwegian . | published in 1879 |
| Belgian . . . | ,, ,, 1885 | Portuguese . | ,, ,, 1876 |
| Danish . . . | ,, ,, 1893 | Russian . . | ,, ,, 1891 |
| Dutch . . . | ,, ,, 1889 | Spanish . . | ,, ,, 1884 |
| French . . . | ,, ,, 1884 | Swedish . . | ,, ,, 1879 |
| German . . . | ,, ,, 1890 | Swiss . . . | ,, ,, 1893 |
| Hungarian . . | ,, ,, 1888 | United States . | ,, ,, 1893 |
| Italian . . . | ,, ,, 1892 | | |

and are thus abbreviated—Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, U.S.

# MATERIA MEDICA,

WITH

# COMPOUNDS AND PREPARATIONS.

Not Official.

## ABRUS PRECATORIUS.

JEQUIRITY.

ROOT.—It is used in many hot countries for the same purpose as liquorice root, hence it is called Indian or Jamaica liquorice, but considering the known poisonous character of the seed, the title is dangerously misleading.

The **root** and an **extract** prepared from it are official in the Pharmacopœia of India.

SEEDS.—An infusion has been introduced in the treatment of granular lids; it sets up a purulent ophthalmia of a croupous nature, varying in intensity with the strength and frequency of the applications. A very strong **infusion,** or rather **paste**, has been also found useful by Dr. Shoemaker in the treatment of affections of the skin, dependent upon exuberant granulations and proliferating cell growths, though only to be used under careful supervision and with due caution. (*Med. Bulletin,* Nov. 1884.) 1 to 3 per cent. **infusion** has been used in granular lids (*L.* '85, ii. 733); also in cases of abscess of the cornea (*L.M.R.* '86, 126, and *T.G.* '87, 640); 1 per cent. **infusion** in granular metritis (*L.M.R.* '86, 541).

Dr. Martin's researches show that the determining causes of the inflammation and the toxic properties in general are due to a globulin and an albumose, the activity of which is rapidly destroyed by a moist heat of 85° C. (180° F.).

It is uncertain whether the toxic properties are due to the proteids or to some toxic ferment associated with them.—*B.M.J.* '92, ii. 184, and *P.J.* xx. 197.

### Preparations.

**INFUSUM ABRI** (*L.O.H.*).—Pour 12½ fl. drms. of Water at 120° F. on 1 drm. of powdered Jequirity seeds, allow it to stand till cold, then decant.

**INFUSUM ABRI** (Moyne's).—Jequirity seeds in powder, 3·2; macerate in cold Water, 500, for 24 hours, and then add hot Water, 500; when cold, filter.

It is used as a lotion three times in one day and repeated on the second and third days if necessary.

**PASTA ABRI** (Dr. Shoemaker's).—Decorticated seeds carefully freed from testa, 200; macerate in Water for 24 hours, reduce in a mortar to a smooth paste, and add sufficient Water to make 800.

To be applied with a camel's hair pencil.

Not Official.

## ABSINTHIUM.

WORMWOOD.

The leaves and flowering tops of *Artemisia absinthium.* It possesses an aromatic odour and a very bitter taste. It contains a crystallisable bitter principle, **Absinthin,** slightly soluble in Water, readily in Alcohol, Chloroform and Ether.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Assencis), Norw., Port. (Losna), Russ., Span. (Ajenjo), Swed., Swiss, and U.S.)

**Medicinal Properties.**—Tonic and Febrifuge. Spirit containing it is much used on the Continent by drunkards; its excessive use causes symptoms known as Absinthism.

### Preparation.

**TINCTURA ABSINTHII.**—Wormwood, 1; Proof Spirit to make 10.

**Dose.**—1 to 4 drms.

(Belg., Dan., Fr., Ger., Norw., Port., Russ., Span., Swed., and Swiss, 1 in 5; Austr. and Hung. (compound), 1 in 10; Fr. (compound), 1 in 40; all by weight. Not in Ital. or U.S.)

## ACACIÆ GUMMI.

### GUM ACACIA.

A gummy exudation from the stem and branches of *Acacia Senegal*, and from other species of Acacia.

It is collected chiefly in Kordofan in Africa, and imported from Alexandria.

The best quality is in spheroidal tears, opaque from numerous cracks, nearly white, but may be in angular masses, more or less transparent, with a yellowish, brownish, or reddish tint.

We have taken the sp. g. of several samples of good white Gum Acacia, and find that it varies very little from 1·5.

It consists chiefly of Calcium Arabate, containing also Potassium and Magnesium, and contains 12 to 17 p. c. of Water.

The formula for Calcium Arabate is $C_{89}H_{142}O_{74}$, $CaO$, corresponding to 2·3 p. c. of Lime, but the total ash should not exceed 4 p. c.

Its aqueous solution reddens blue litmus paper.

**Solubility.**—1 in 1 of Water. Insoluble in Alcohol, Ether, and Oils.

**Tests.**—Powder of Gum should be white and free from Starch, and therefore a solution made with boiling Water and cooled should not be rendered blue or violet by an aqueous solution of Iodine.

A Gum of good quality should not reduce Fehling's Solution on heating to boiling. Treatment with boiling Acid makes Arabic Acid reduce Fehling. *Allen.*

Adulteration with Dextrin can be detected by the use of Ferric Chloride and Alcohol. For process see *Allen.*

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

**Medicinal Properties.**—Emollient, nutritive. Allowed to dissolve slowly in the mouth, allays tickling cough. For a demulcent drink, 1 of Mucilage, 1 of Syrup, and 20 of Water.

**Dose.**—*Ad libitum.*

Used in the preparation of Mistura Cretæ, Mistura Guaiaci, Pulvis Amygdalæ Compositus, Pulvis Tragacanthæ Compositus, and all Trochisci.

### Preparation.

**MUCILAGO ACACIÆ.** Faintly coloured, slightly opaque.

Gum Acacia, in small pieces, 40; Distilled Water, 60: put these into a covered jar and stir frequently until the gum is dissolved.

It is best filtered through well-shrunk flannel.

The product measures only 87, therefore 4 of Gum are contained in $8\frac{3}{4}$ measures of Mucilage. Sp. g. 1·160 to 1·170.

**Dose.**—1 to 4 drms.

Mucilage keeps well if made cold, then poured into small bottles quite full, and stored in a cool place.

Squibb has found that solution of the Gum is facilitated by using it in the form of a coarse powder, not larger than No. 50, nor smaller than No. 80 sieve, free from fine powder.—*Squibb.*

German and United States Pharmacopœias direct that the Gum should be washed with cold Water, before being dissolved.

Mucilage, if kept carelessly only a week in hot weather, becomes sour, and its emulsive property is impaired; if made with hot Water the change is more rapid.

The substitution of Glycerine for half the Water has been suggested; it makes a clearer solution, and keeps about as well, but the Gum takes much longer to dissolve.

B.P. Mucilage of Acacia keeps better than the weaker preparation of U.S.P., even when Cinnamic Acid has been added to the latter.

It is much used in cough linctuses and lozenges, and frequently to render oils, &c., emulsive with aqueous fluids; 3 drms. are required for 1 oz. of oils or resinous tinctures, 10 drms. for 1 oz. of Copaiba. The Mucilage should be put into a mortar and the Oil added by degrees, with constant trituration. Used to keep Bismuth and other powders suspended, but Tragacanth answers better. It is sometimes used to make powders into pills, but they become hard after being kept a short time, therefore Glycerine, Glycerine and Mucilage equal parts, Glycerine of Tragacanth, Glucose, &c., are to be preferred.

It is impossible to make a nice emulsion with some of the oils (the Oil of Male Fern for instance) unless the Mucilage be good; if fresh Mucilage is not at hand, half the quantity of the powder of Acacia can be used; first rub the powder with the Oil, then add Water equal to double the weight of the powder, and rub till an emulsion is formed; now add by degrees any quantity of aqueous liquid ordered in the prescription.

(Dutch and Port., 2 and 3 ; Fr., 1 and 1 ; Austr., Dan., Ger., Hung., Ital., Norw., Russ., Swed., and Swiss, 1 and 2; Span., 1 and 3 ; Belg., 1 and 4—also M. Spissa, 1 and 2—and M. Levis, 1 and 9 ; U.S. 34 and 66.)

**Incompatibles.**—Alcohol and Sulphuric Acid; Borax, Persalts of Iron, and Subacetate of Lead render it gelatinous. It is not affected by neutral Acetate of Lead

## Not Official.

**POTION GOMMEUSE** (Fr.).—Powdered Gum Arabic, 1; Simple Syrup, 3; Orange Flower Water, 1 ; Water, 10. All by weight.

**SIROP DE GOMME** (Fr.).—Gum, 10; Sugar, 67; Water, 43; dissolve the Gum in cold Water, then the Sugar by the aid of a water-bath; and strain.

**SYRUPUS ACACIÆ** (U.S.).—Mucilage of Acacia, 1; Syrup, 3. Mix when required, as it does not keep well.

**UNNA'S GUM PASTES.**—A mixture of equal parts of Mucilage of Acacia and Glycerine, with which are incorporated various medicaments such as Oxide of Zinc and Oxide of Mercury.

# ACETANILIDUM.

ACETANILIDE.

$C_8H_9NO$.

*B.P.Syn.*—PHENYL-ACETAMIDE, $C_6H_5$, NH. $C_2H_3O$.

Commonly known as "Antifebrin."

Prepared by prolonged heating together of Aniline and Glacial Acetic Acid, distilling the Acetanilide and purifying it by crystallisation.

It forms colourless, glistening, scaly crystals, having a slightly pungent taste and neutral reaction. Heated with free access of air, it burns, leaving no residue.

**Solubility.**—1 in 190 of Water; 1 in 18 of boiling Water; 1 in 12 of Proof Spirit; 1 in 4 of Rectified Spirit; about 1 in 40 of Glycerine; it is also soluble in Ether, Benzol, and Chloroform.

**Tests.**—**Melting point** as given in B.P. additions is 235° F. (112·8° C.), but a lower figure will be found if the substance be not previously dried at 212° F. (100° C.). It visibly softens several degrees below the actual melting point. If heated below water, it fuses considerably under 212° F. (100° C.). **Boiling point** usually given is 295° C. (563° F.), but it volatilises to a considerable extent at 100° C. (212° F.), and if an aqueous solution be distilled, Acetanilide may be detected in the distillate by the Iso-Nitrile test.

When Acetanilide is heated with solution of Potash (which liberates Aniline) and a few drops of Chloroform, Phenyl-Iso-Nitrile is formed, recognizable by its disagreeable smell. With Sulphuric Acid it should form a colourless solution.

Its solution in boiling Water, *after cooling*, is not affected by solution of Perchloride of Iron.

With a hot solution a deep red colour is produced.

A cold saturated aqueous solution decolourises Bromine Water, and at the same time throws down a white precipitate, quite distinct even at a dilution of 1 in 2000.

If the Bromine Water precipitate be dissolved by heat, it crystallises out on cooling in long tufted needles.

Heated in a Capsule with Mercuric Nitrate, it gives an intense green colour soluble in Alcohol.

(Austr., Dan., Dutch, Ger., Hung., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Antipyretic and antiseptic. Useful in typhoid fever, erysipelas, phthisis, rheumatism, and small-pox. An anodyne in neuralgia and nerve affections.

In some cases it produces profuse sweating, accompanied with cyanosis and rigor; it is therefore safer to commence with small doses.

References.—*L.* '86, ii. 462. Nervous affections, *L.* '87, i. 41, 104; *B.M.J.* '87, ii. 431; *L.* '88, i. 191. Phthisis, *B.M.J.* '87, i. 590; '87, ii. 1396. Typhoid, *T.G.* '87, 123; *B.M.J.* '90, ii. 1238; *B.M.J.* '91, i. 172. Small-pox, *T.G.* '88, 630. Bronchitis, *L.* '91, i. 1424. Summary, *B.M.J.* '87, ii. 1438; *T.G.* '88, 571. Not altogether without danger, *L.* '90, i. 376, 575, 1136; *L.* '92, ii. 620.

From the report of a committee of the British Medical Association, it would appear that Antifebrin is less safe and less constant in its action than Antipyrin, but it is possible that the ill-effects noted were brought about by injudicious dosage. To give it in doses of 5, 6, 8, or even 10 grains, still more to repeat these after a short interval, is highly injudicious; such doses are excessive. The relative dose appears to be about one-fifth that of Antipyrin (*see* Phenazonum).—*B.M.J.* '94, i. 89.

**B.P. Dose.**—3 to 10 grs.

Best given in wafer paper or **cachets**, or dissolved in some weak spirit.

### Not Official.

## ACETOPHENONE.

*Syn.*—HYPNONE; METHYLPHENYLACETONE; METHYL-BENZOYL.

A colourless, very refrangent liquid ($C_6H_5$, $CO.CH_3$) with a persistent odour of Essential Oil of Almonds. A commercial sample crystallised at about 4° C. (39·2° F.), the temperature rising at the same time to 12° C. The melting point of the Crystals was 14° C. (57·2° F.); sp. g. 1·027; commenced to boil at 153° C., and rose to 200° C.

**Solubility.**—Insoluble in Water; soluble 1 in 90 of Glycerine; mixes in all proportions with Rectified Spirit, Proof Spirit, Ether, Chloroform, and Olive Oil.

**Medicinal Properties.**—Introduced as a hypnotic, but rarely used now.—*L.M.R.* '87, 545; *T.G.* '86, 648; also '87, 253; *P.J.* xvi. 582; *B.M.J.* '89, ii. 969.

**Dose.**—2 to 8 minims (increased) dissolved in ten times as much Oleum Amygdalæ. Given in **Capsules** and in **Syrup**.

## ACETUM.

### VINEGAR.

An acid liquid of a brown colour and peculiar odour, prepared from a mixture of malted and unmalted grain by the acetous fermentation.

Should contain 5·41 per cent. real Acid, $HC_2H_3O_2$, but commercial samples vary a good deal.

**Tests.**—Sp. g. 1·017 to 1·019. 445·4 grains by weight (1 fluid ounce) require about 402 grain-measures of the volumetric Solution of Soda for neutralisation.* Sulphuretted Hydrogen causes no change in colour—indicating absence of heavy metals, and if the further addition of Ammonia causes no darkening, Iron is likewise absent.

According to the B.P., "If ten minims of Solution of Chloride of Barium be added to a fluid ounce of the vinegar, and the precipitate, if any, be separated by filtration, a further addition of the test should give no precipitate."

The intention of this test is to ensure the absence of more Sulphuric Acid in the vinegar than is allowed by the Excise for preservative purposes, but for two reasons this end is not attained.

The quantity of Barium Chloride (·87 gr.) is only sufficient to precipitate ·348 gr. of Sulphuric Acid, and although the limit allowed by law is frequently referred to (and apparently so understood by the B.P.) as $\frac{1}{1000}$ by weight (·437 gr. per oz.), it really is $\frac{1}{1000}$ by volume, or ·80 gr. per oz., which requires 2 grs. of Barium Chloride or 23 minims of the B.P. test solution, instead of

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* Phenol-phthalein is better than Litmus as an indicator for this and most organic acids.

10 minims as ordered. But even this is quite unreliable, owing to the presence in vinegar of varying quantities of alkaline and earthy sulphate, between which and free Sulphuric Acid the test makes no differentiation, and so might condemn a vinegar containing a proportion of Sulphuric Acid well within the legal limits.

Where the solution is only slightly coloured, there are two methods by which free Mineral Acid can be accurately differentiated both from Organic Acids and Mineral Salts. 1. By the decolourising action of Mineral Acids on Ferric Acetate.—*P.J.* viii. 993. 2. The action of Mineral Acids on Methyl Violet.—10 drops Methyl Violet solution (1 : 500) added to 50 c.c. Diluted Acetic Acid gives a bluish-violet colour. If the sample contains $\frac{1}{2000}$ by weight of Sulphuric Acid, the colour is pure blue; with $\frac{1}{1000}$ greenish blue; with $\frac{1}{500}$ (legal limit), a bluish green; with $\frac{1}{250}$ an almost pure green.

It must further be noted that the quantity of free Mineral Acid added and the quantity of free Mineral Acid capable of estimation will not correspond, owing to the fact that vinegar contains Salts of Organic Acids, which must all be decomposed with liberation of the Organic Acid before any trace of free Mineral Acid can be detected. These Organic Salts if ignited leave an alkaline residue of Carbonate, and if Vinegar ash is alkaline, it is proof that no excess of Mineral Acid existed in it before evaporation. On these lines is based a process for estimating the free Acids:—To a 50 c.c. of Vinegar add a given vol. (say 10 c.c.) of $\frac{N}{10}$ Soda, evaporate to dryness, char the residue and titrate the alkali contained in it. The deficiency between the quantity of $\frac{N}{10}$ Acid required and 10 c.c. represents exactly the Mineral Acid present. The advantage of this process is that it is applicable to liquids too dark in colour to be tested by Methyl Violet or Iron Acetate.

(Austr., Belg., Ger. and Hung., 6 per cent. Acetic Acid; Dan. and Swed., 4·7 p. c.; Port., 7—9 p. c.; Russ., 6 p. c.; Span., sp. g. 1·018 – 1·020; Swiss, 5 p. c.: all are without Sulphuric Acid. Not in the others.)

**Medicinal Properties.**—Given to diminish profuse sweating in hectic cases. Diluted 1 in 10 of Water is used also to sponge the surface of the skin in fevers, or with lint as a cooling **lotion** to bruises and sprains.

The most ready and safe antidote in cases of poisoning by alkalies.

A wineglassful of Vinegar has been given internally with good effect in post-partum hæmorrhage.—*B.M.J.* '84, i. 56.

**Dose.**—1 drm. to 1 oz. diluted.

**Incompatibles.**—Ammonia, Lime, all the Alkalies, and Carbonates.

Used in making Empl. Saponis Fuscum.

**ACETUM CANTHARIDIS.**—*See* CANTHARIS.

**ACETUM SCILLÆ.**—*See* SCILLA.

## ACIDUM ACETICUM.

ACETIC ACID.

A colourless acid liquid, with pungent odour, prepared from wood by destructive distillation and subsequent purification, containing 33 per cent. by weight of real Acid, $HC_2H_3O_2$, eq. 60.

A mixture of equal volumes of this Acid and of Water is of the same neutralising power as the diluted mineral acids of the Pharmacopœia.

**Tests.**—Sp. g. 1·044. 182 grains by weight require for neutralisation 1000 grain-measures of the volumetric Solution of Soda. It leaves no residue when evaporated. It gives no precipitate with Sulphuretted Hydrogen, Chloride of Barium, or Nitrate of Silver—indicating absence of metals, Sulphuric and Hydrochloric Acids. If a fluid drachm of it mixed with half an ounce of Distilled Water and half a drachm of pure Hydrochloric Acid be put into a small flask with a few pieces of Granulated Zinc, and while the effervescence continues, a slip of bibulous paper wetted with Solution of Subacetate of Lead be suspended in the upper part of the flask above the liquid for about five minutes, the paper will not become discoloured—indicating absence of Sulphurous Acid.

A much more ready test for this impurity is to add a drop of Tincture of Iodine to a drachm of the Acid, which gives it a yellowish-brown tint if the Acid be pure, but is instantly decolourised if there be Sulphurous Acid present equal to $\frac{1}{160}$ grain in the fluid drachm.—*P.J.* xix. 566.

When supersaturated with Solution of Potash it should not have a smoky odour or taste, indicating absence of empyreumatic substances.—*U.S.*

(U.S., 36 per cent. Acid, sp. g. 1·048; Norw. and Swed., 29 p. c., sp. g. 1·040; Dan., Dutch, and Russ., 30 p. c.; Port. (Acido Acetico Hydratado), 38 p. c., sp. g. 1·050; Fr., 50 p. c., sp. g. 1·060.

The Acidum Aceticum of Belg., Ger., and Span. is practically Glacial; Belg. and Ger., 96 p. c., sp. g. 1·064; Span., 94—98 p. c., sp. g. 1·060—1·067.

The Acidum Aceticum Dilutum of Austr., Ger., Hung., and Swiss more resembles B.P. Acidum Aceticum; Austr., 20·4 p. c.; Hung., 20 p. c.; Ger. and Swiss, 30 p. c.)

**Medicinal Properties.**—A local stimulant. "A good application for ringworm on the body" (*Ringer*). As a **gargle** 15 minims to 1 ounce of Water. When diluted it can be used for the same purposes as Vinegar.

Used in the preparation of Acetum Cantharidis, Extractum Colchici Aceticum, Injectio Morphinæ Hypodermica, Liquor Ammonii Acetatis Fortior, Oxymel, Tinct. Ferri Acetatis and Vinum Ipecacuanhæ.

### Preparation.

### ACIDUM ACETICUM DILUTUM.

Acetic Acid, 1; Distilled Water, 7; mix. =(1 in 8).

Colourless, contains 4·27 per cent. of real Acid, $HC_2H_3O_2$, eq. 60.

**Test.**—Sp. g. 1·006. 440 grains by weight (1 fluid ounce) require for neutralisation 313 grain-measures of the volumetric Solution of Soda.

**Dose.**—1 drm. to 1 oz. with Water.

(Austr., 20·4 p. c. Acetic Acid, sp. g. 1·028; Ger. and Swiss, 30 p. c., sp. g. 1·041; Hung., 20 p. c.; Ital., 19 p. c.; Belg., 9·6 p. c., sp. g. 1·014; Dutch, 6 p. c.; Port., A. A. Aquoso, 10 p. c., sp. g. 1·015; Russ., 5 p. c.; U.S., 6 p. c., sp. g. 1·008; see also Acetum.)

Used to prepare Acetum Ipecac., Acet. Scillæ and Liquor Morphinæ Acetatis.

# ACIDUM ACETICUM GLACIALE.

GLACIAL ACETIC ACID.

Contains nearly 99 per cent. of real Acetic Acid, $HC_2H_3O_2$, eq. 60.

It is three times as strong as Acidum Aceticum, and nearly twenty-four times as strong as Acidum Aceticum Dilutum.

A colourless liquid, with pungent acetous odour; it crystallises when cooled, and remains crystalline until the temperature rises to above 60° F. (15·5° C.).

Useful table for determining the strength of Glacial Acid by the freezing point will be found *P.J.* ii. 241.

It **dissolves** Camphor, Gum-resins, Resins, and Volatile Oils.

**Tests.**—60 grains by weight in an ounce of Water require for neutralisation at least 990 grain-measures of the volumetric Solution of Soda. Tried by the test mentioned under Acetic Acid, should indicate absence of Sulphurous Acid. Sp. g. 1·058, which is increased by adding 10 per cent. of Water.

The sp. g. increases with the gradual addition of Water until 30 per cent. has been added, when it will have sp. g. 1·078; the further addition of Water again reduces it. When 100 per cent. (equal volumes) of Water have been added, it will be sp. g. 1·063.

When diluted gives no precipitate with Chloride of Barium or Nitrate of Silver—indicating the absence of Sulphuric and Hydrochloric Acids.

When supersaturated with Solution of Potash it should not have a smoky odour or taste—absence of empyreumatic substances.—*U.S.*

An Acetic Acid which passes the Potash test and all the B.P. tests may yet convey a disagreeable odour to Liquor Ammonii Acetatis Fortior.

Mix 1 c.c. of Acid with 5 c.c. distilled Water in a clean test tube, and then add one drop of decinormal solution of Permanganate of Potash; should not be sensibly changed in one hour.—*Squibb.* Scarcely any Acid will pass this test.

(Austr. and Hung. (A. A. Concentratum), Belg., Ger. and Swiss (Acidum Aceticum), Ital. (Acido Acetico Concentrato), all 96 p. c., sp. g. 1·064; Russ. (A. A. Concentratum), 95—96 p. c.; Span. (Acido Acetico, 94—98 p. c., sp. g. 1·060—1·067; U.S., sp. g. not higher than 1·058, at least 99 p. c.; Fr. (Acide Acétique Crystallisable), Port. (A. A. Glacial) and Swed. (A. A. Concentratum), nearly 100 p. c.; not in the others.)

**Medicinal Properties.**—Escharotic; used for corns and warts; it speedily vesicates, and thus is useful in cases where Cantharides may do harm by being absorbed, but it causes much pain, and if applied incautiously may produce a most troublesome sore. When scented, is employed to fill vinaigrettes containing sponge or fragments of Sulphate of Potassium.

Used in the preparation of Acetum Cantharidis, Linimentum Terebinthinæ Aceticum, Liquor Ferri Acetatis Fortior, and Mistura Creasoti.

**Antidotes.**—Large quantity of Soap and Water to be swallowed; Lime Water, or Chalk and Water; Fluid Magnesia. Stomach-pump *not* to be used.—*Murrell.*

### Not Official.

**ACIDUM ACETICUM AROMATICUM** (Belg. and Russ.).—Glacial Acetic Acid, 72; Oil of Cloves, 9; do. Lavender, 6; do. Orange, 6; do. Bergamot, 3; do. Thyme, 3; do. Cinnamon, 1; all by weight; mix and filter.

**ACETUM AROMATICUM** (Ger.).—Oils of Lavender, Peppermint, Rosemary, Juniper, and Cinnamon, of each 1; Oil of Lemon, 2; Oil of Cloves, 2; Spirit, 450; Diluted Acetic Acid, 650; Water, 1900; all by weight: digest some days and filter.

**VINAIGRE ANGLAIS** (Fr.).—Glacial Acetic Acid, 500; Camphor, 50; Oil of Cinnamon, 1; Oil of Cloves, 1; Oil of Lavender, $\frac{1}{2}$; all by weight: mix.

**VINAIGRE DES QUATRE VOLEURS** (Fr.).—Tops of the Greater and Lesser Wormwood, Rosemary, Sage, Peppermint, Rue, and Lavender Flowers, of each 15; Calamus Root, Cinnamon, Cloves, Nutmeg, and Garlic, of each 2; Camphor, 4; Glacial Acetic Acid, 15; Strong White Vinegar, 1000; dissolve the Camphor in the Glacial Acid; macerate the other ingredients in the Vinegar for ten days; press and mix.

**VAPOR ACIDI ACETICI** (*T. H.*).—Glacial Acetic Acid and Acetic Acid, equal parts; mix. Two teaspoonfuls in a pint of water at 140° F. for each inhalation. Sedative; used for inflammatory sore throat of scarlet fever.

**ACIDUM TRICHLORACETICUM** (Ger. and Russ.).—A substitution product from Acetic Acid, but it is most readily prepared by acting on Chloral Hydrate with Nitric Acid in sunlight. Colourless, deliquescent Crystals, which fuse at 51° C., and boil at 195° C.

Readily soluble in Water and Rectified Spirit.

It is a powerful antiseptic. 1 or 2 p. c. solutions have been used as a dressing for wounds. Internally, in dilute solution, 2 to 5 grains for adults, $\frac{1}{2}$ to 1 grain for children in gastric catarrh and summer diarrhœa.—*L.M.R.* '83, 285; *T.G.* '85, 63.

A test for Albumen in Urine.—*B.M.J.* '89, ii., 1114, and '90, i., 681.

## ACIDUM ARSENIOSUM.

ARSENIOUS ACID.

*B.P.Syn.*—ARSENIOUS ANHYDRIDE; WHITE ARSENIC.

$As_2O_3$, eq. 198.

An anhydride (not a true acid) obtained by roasting arsenical ores, and purified by sublimation.

A heavy white powder, or in sublimed masses which usually present a stratified appearance, caused by the existence of separate layers differing from each other in degrees of opacity. When slowly sublimed in a glass tube it forms minute brilliant and transparent crystals of octahedral character. Sprinkled on red-hot coal, it emits an alliaceous odour.

It is **vitreous or glassy** when condensed on a surface, the temperature of which is little below the subliming point of the Acid, and is more soluble than the **octahedral or opaque** which is formed when the vapour condenses on a cold surface and passes directly from the gaseous to the solid form. The **vitreous** in course of time becomes **opaque** from the outside inwards from gradual change to the crystalline condition. The vitreous oxide on heating fuses before it volatilises to any considerable extent, but the opaque sublimes without previous fusion.—*Watts.*

**Solubility.**—1 in 100 of cold Water; 1 in 20 of boiling Water; 1 in 500 of Rectified Spirit; 1 in 6 of Hydrochloric Acid; 1 in 8 of

Glycerine; 1 in 11 of Solution of Potash; 1 in 40 of saturated Solution of Carbonate of Sodium.

These figures are approximate. The published solubilities of Arsenious Acid are very contradictory, owing, no doubt, to the specimens examined being either vitreous, opaque, or a mixture of the two, and therefore of different solubilities.

**Tests.**—Entirely volatilised at a temperature not exceeding 400° F. (204·4° C.). 4 grains of it, dissolved in boiling Water with about 20 grains of Bicarbonate of Sodium, discharge the colour of 808 grain-measures of the volumetric Solution of Iodine; the Arsenite of Sodium is converted into Arseniate, and the Iodine into Iodide of Sodium. An aqueous solution gives a canary-yellow precipitate with Ammonio-nitrate of Silver, and a green precipitate with Ammonio-sulphate of Copper; both these precipitates are soluble in Ammonia, or Nitric Acid.

(Belg., A. Arseniosum; Austr., Dan., Dutch, Ger., Hung., Norw., Russ., Swed. and Swiss, A. Arsenicosum; Fr., Acide Arsenieux; Ital., Anidride Arseniosa; Port., Acido Arsenioso; Span., Arsenico Blanco; U.S., A. Arsenosum.)

**Medicinal Properties.**—A nerve tonic. It is given in eczema, in chronic cutaneous diseases, and in chronic rheumatism of the joints. Antiperiodic in agues and neuralgic affections. Best given immediately after meals. Externally is a powerful caustic, and requires great care, as there is danger of absorption; but this can be prevented by using "sufficient quantity to produce active inflammation" (*Ringer*). Given in pernicious anæmia with good results (*L.* '85, i. 653; *B.M.J.* '88, ii. 982, and '90, i. 130); also in various glandular affections (*L.M.R.* '81, 98, 103; also *B.M.J.* '85, ii. 598, and *L.* '87, i. 679); in paroxysmal sneezing (*B.M.J.* '87, ii. 921); in chorea and epilepsy.

**Dose.**—$\frac{1}{60}$ to $\frac{1}{12}$ of a grain in solution or well mixed with Sugar of Milk in a pill.

Ph. Ger. maximum single dose, ·005 gramme ($=\frac{1}{13}$ grain), maximum daily dose, ·02 gramme ($=\frac{2}{7}$ grain).

One of the symptoms of injurious effects from the continued use of Arsenic is œdema of the eyelids.

**Incompatibles.**—Salts of Iron, Magnesia, Lime Water, and astringent matters.

**Antidotes.**—The freshly prepared moist Peroxide of Iron, or large quantities of Calcined Magnesia; Dialysed Iron (followed by some Common Salt to ensure precipitation of Ferric Hydrate); Stomach pump, Emetics; Mucilaginous drinks, Olive Oil, or Carron Oil; stimulants freely, if much prostration; warmth (hot blankets and bottles).

**Antidotum Arsenici** (Belg., Dan., Dutch, Hung., Port., Russ., Swed., and Swiss).

They vary considerably in the quantities of Iron, Magnesia, and Water; Hung., Russ., Swiss, and U.S. employ Persulphate of Iron; Belg., Dan., Dutch, Port., and Swed. use Perchloride of Iron.

U.S. formula (Ferri Oxidum Hydratum cum Magnesia).—Mix 50 grms. of Solution of Ferric Sulphate (sp. g. 1·320) with 100 c.c. of Water, and keep the liquid in a large, well-stoppered bottle. Rub 10 grms. of Magnesia with cold water to a smooth and thin mixture, transfer this to a bottle capable of holding about 1000 c.c., and fill it with water to about three-fourths of its capacity. When the preparation is wanted for use, shake the Magnesia mixture to a homogeneous, thin magma, gradually add to it the Iron solution, and shake them together until a uniform smooth mixture results.

NOTE.—The diluted Solution of Ferric Sulphate, and the mixture of Magnesia with Water, should always be kept on hand, ready for immediate use.

## Preparations.

**LIQUOR ARSENICALIS.** *B.P. Syn.*—LIQUOR POTASSÆ ARSENITIS. FOWLER'S SOLUTION.

Arsenious Acid, 87 grs.; Carbonate of Potassium, 87 grs.; Compound Tincture of Lavender, 5 drms.; Distilled Water, a sufficiency: place the Arsenious Acid and the Carbonate of Potassium in a flask with 10 oz. of the Water and apply heat until a clear solution is obtained. Allow this to cool, then add the Compound Tincture of Lavender, and as much distilled Water as will make the bulk 20 oz.

=(1 grain of Arsenious Acid in 110 minims).

Solution is much more readily effected by using $\frac{1}{2}$ oz. of Water to dissolve these quantities, then diluting to 10 oz., and proceeding as directed above.

This preparation is intended to contain **one per cent.** of Arsenious Acid (that is one grain in 100 grain-measures), but accurately the quantity should be 87·5 grains.

A reddish liquid, alkaline to test paper, sp. g. 1·010.

**Tests.**—After being acidulated with Hydrochloric Acid it gives, with Sulphuretted Hydrogen, a yellow precipitate, which is brightest when the Arsenical Solution has been previously diluted. 442 grains by weight (one fluid ounce), boiled for five minutes with 10 grains of Bicarbonate of Sodium, and when cold diluted with 6 fluid ounces of Water, to which a little Mucilage of Starch has been added, does not give with the volumetric solution of Iodine a permanent blue colour until 875 grain-measures have been added; corresponding to 1 p.c. of Arsenious Acid, or to rather more than 4 grains ($4\frac{1}{3}$) in one fluid ounce.

**Dose.**—2 to 8 minims; but much larger doses are given in chorea.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Swed., Swiss, and U.S., 1 Arsenious Acid in 100; Span., 1 in 90.)

**LIQUOR ARSENICI HYDROCHLORICUS.**

Arsenious Acid, 87 grs.; Hydrochloric Acid, 2 drms.; Distilled Water, 20 oz.: boil the two Acids with 4 oz. of the Water until a solution is effected, then add sufficient Distilled Water to make 20 oz.

=(1 grain of Arsenious Acid in 110 minims).

Same strength as the Liquor Arsenicalis.

A colourless liquid, acid to test paper, sp. g. 1·010.

**Test.**—Same as above, but using 20 grains instead of 10 grains of Bicarbonate of Sodium.

**Dose.**—2 to 8 minims.

(U.S. 1 of Arsenious Acid in 100.)

**LIQUOR ARSENII ET HYDRARGYRI IODIDI.**—*See* ARSENII IODIDUM.

**ARSENIAS FERRI.**—*See* FERRI ARSENIAS.

**ARSENIAS SODII.**—*See* SODII ARSENIAS.

**ARSENIATIS SODII LIQUOR.** } *See* SODII ARSENIATIS
1 grain in 109 minims. **Dose**, 5 to 10 minims. } LIQUOR.

### Not Official.

**LIQUOR AMMONII ARSENITIS** is made of the same strength as Liquor Arsenicalis; Carbonate of Ammonium being substituted for Carbonate of Potassium.

**PILULA ASIATICA.**—Arsenious Acid, $\frac{1}{12}$ grain; black Pepper, $\frac{1}{2}$ grain; Extract of Gentian, 1 grain, for one pill.

Used as a specific in various chronic skin eruptions.

**SOLUTIO SOLVENTIS MINERALIS** of Dr. De Valangin (the Liquor Arsenici Chloridi of the London Pharmacopœia) contains 30 grains of Arsenic dissolved by 90 minims of Hydrochloric Acid in 20 ounces of Water; is about one-third of the strength of the British Pharmacopœia preparation.

**Dose.**—3 minims three times a day, increasing to 10 minims for chorea.

**ARSENICAL PASTE** for Dentists.—Arsenious Acid, 2; Sulphate of Morphine, 1; Creasote to make a stiff paste. A quantity of the size of a pin's head is ample for one application. It should be spread on cotton-wool and placed in the tooth. It will thus destroy the sensibility of a carious tooth, and in a few hours the tooth is ready for stopping. Cocaine if applied before the arsenical paste prevents the pain.

**ARSENICAL PASTE** (Frères Come's), for cancer, applied after the surface has been laid bare by the application of caustic potash. Arsenic, 1; Charcoal, 1; Red Sulphuret of Mercury, 4; Water, *q. s.*

**ARSENICAL CAUSTIC POWDERS** each contain from $\frac{1}{16}$ gr. to $\frac{1}{8}$ gr. of Arsenious Acid to 1 gr. of Calomel, Vermilion, or Sulphuret of Antimony, or of any combination of them.

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## ACIDUM BENZOICUM.

BENZOIC ACID.

*N.O.Syn.*—Flowers of Benzoin; Hydrate of Benzoyl.

$HC_7H_5O_2$, eq. 122.

An Acid obtained from Benzoin, and prepared by sublimation. Not chemically pure.

In light, feathery, crystalline plates and needles, which are flexible, nearly colourless, and have an agreeable aromatic odour resembling that of Benzoin. Melts at 248° F. (120° C.), and boils at 462° F. (238·9° C.).

The Commercial Varieties of this Acid are:—

1. **Resin Sublimed Acid.**—Characterised by its strong empyreumatic odour, colour (varying from a pale yellow to light brown), and reducing action on both Permanganate solution and Ammoniacal Silver Nitrate; it may or may not contain Cinnamic Acid, according to the variety of the Benzoin from which it is made.

Although this is the only Acid recognised by the B.P. it is practically unobtainable in this country. It is also official in Austr., Dutch, Ger. and Hung.

2. **Resin Precipitated Acid.**—This is prepared from Benzoin by one of the "wet processes," such as boiling with Milk of Lime to form a soluble Benzoate, which is afterwards decomposed by an Acid with separation of the slightly soluble Acid Benzoic. It is practically a pure chemical; has no empyreumatic odour; and has no reducing action either on Permanganate or Ammoniacal Silver solution. This is the variety commonly sold as B.P. and intended to be used in

the U.S.P., which however will pass a sufficiently purified Acid, from whatever source derived.

3. **Hippuric Benzoic Acid.**—When imperfectly purified this Acid retains a distinct urinous odour, and is guarded against in most foreign Pharmacopœias, but it has been shown (*P.J.* xiv. 463) that Acid from this source, after resublimation, will pass the purity tests of any Pharmacopœia, so that its use is mainly a question of price.

4. **Toluol Benzoic Acid.**—This is now manufactured in very large quantities, principally for conversion into Alkaline Benzoates, but partly for sale as Benzoic Acid. In the latter case it is frequently said to be sublimed over a little Gum Benzoin to give it something of the aromatic odour of the Natural Acid. This Artificial Acid conforms with most tests, but is practically certain to be contaminated with Chlorine compounds, easily detected by mixing ½ grm. of the Acid with slaked Lime (free from Chlorine), damping with water, igniting, dissolving the residue in Nitric Acid and adding Silver Nitrate. A turbidity or precipitate is practical proof of the Toluol source of the Acid.

**Solubility.**—1 in 390 of Water; 1 in 12 of boiling Water; 1 in 2¾ of Rectified Spirit; 1 in 2¾ of Ether; nearly 1 in 6 of Chloroform; 1 in 12 of Benzol; about 1 in 30 of Glycerine. Borax increases its solubility in Water; 1 of Borax and 1 of Acid are soluble in 100 of Water; Phosphate of Sodium also aids its solution.

The solubility of Benzoic Acid in Water is variously given as:—U.S., 1 in 500; Ger., 1 in 370; Hung., 1 in 350; Eagle, 1 in 250; Martindale, 1 in 220. We find that Benzoic Acid sublimed from Benzoin does not dissolve 1 in 370 of Water at 60° F. in 3 days, but completely dissolves 1 in 390.

**Tests.**—When heated it sublimes, leaving only a slight residue. Soluble in aqueous solutions of the Caustic Alkalies and in hot Milk of Lime, forming Benzoates, from which it is precipitated on the addition of Hydrochloric Acid unless the solution be very dilute.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

**Medicinal Properties.**—Stimulant, expectorant, diuretic; said to cure nocturnal incontinence of urine; given in 5 or 6 grain doses for inflammation of the bladder, frequently at first, afterwards at longer intervals and in diminished doses.

It possesses antiseptic properties; a saturated solution in water delays decomposition of animal fluids; it is also useful in preventing fats from becoming rancid.

As a **lotion** one grain in an ounce of water, or a stronger solution in Spirit to be diluted as required.

Is a valuable remedy in acute rheumatism when Salicylic Acid or its Sodium Salt either cannot be borne or fails to produce any effect.—*L.M.R.* '80, 94.

It has been used with advantage in the treatment of gout.—*B.M.J.* '86, i. 734.

It has been supposed that Benzoic Acid converts Uric Acid into Hippuric Acid in the animal organism, and so assists its elimination in cases of gout and rheumatism. It would appear, however, that it is the Benzoic Acid itself which is converted into Hippuric Acid, and as this happens in the kidneys and not at all in the blood, any benefit arising from the use of Benzoates in these diseases cannot be attributed to the above reaction.—*Brunton*, p. 965.

*Stimulates the liver, but its action is less rapid and less powerful than that of its salts.—Dr. Rutherford.*

**Dose.**—5 to 15 grs.: best given wrapped in wafer-paper, or in **cachets**, or in **pills** made up with a mixture of equal parts Treacle and liquid Glucose.

Used in the preparation of Ammonii Benzoas; Tinct. Camphoræ Composita, 2 grs. in each ounce; and Tinct. Opii Ammoniata, 9 grs. in each ounce.

### Preparation.

**TROCHISCI ACIDI BENZOICI.**

Benzoic Acid, made into a lozenge with Sugar and Gum Acacia. Each lozenge contains half a grain of Benzoic Acid.

**Dose.**—1 to 5 lozenges.

These lozenges are also made with Red Currant Paste.—*T.H.*

### Not Official.

**VAPOR ACIDI BENZOICI** (*T.H.*).—Benzoic Acid, 3 grs.; Kaolin, 12 grs.; rub together and add Water, ½ oz; Tincture of Tolu, 18 mins.; shake and make up with Water to 1 oz.

Extremely serviceable in acute affections of the air passages.

**BENZOIC GAUZE.**—Contains 4 per cent. of Benzoic Acid.

## ACIDUM BORICUM.

BORIC ACID.

*B.P.Syn.*—Boracic Acid.

$H_3BO_3$, eq. 62.

A weak Acid obtained by the action of Sulphuric Acid on Borax; also by the purification of native Boric Acid.

Colourless, pearly, lamellar crystals or irregular masses of crystals; unctuous to the touch; easily powdered. The crystals liquefy when warmed, and on careful ignition lose 43½ per cent. of their weight, the product solidifying on cooling to a brittle glass-like mass.

Why this particular substance has been selected in B.P. for the description "easily powdered" is not readily understood. It is about the only substance so described, and is probably the most difficult of accomplishment.

It volatilises in vapour of water at 100° C. (212° F.), which prevents its estimation by evaporation.

**Solubility.**—1 in 25 of cold Water; 1 in 3 of boiling Water; 1 in 4 of Glycerine; 1 in 18 of Rectified Spirit.

**Tests.**—Its solution turns blue litmus red and turmeric paper brownish-red, which is intensified by Hydrochloric Acid, particularly on drying, and this changes to a greenish colour on the addition of solution of Potash. The Alcoholic solution burns with a flame tinged with green. Its aqueous solution should not give more than a faint opalescence with Chloride of Barium (Sulphates), Nitrate of Silver (Chlorides), or Oxalate of Ammonium (Calcium); nor yield any precipitate with Sulphide of Ammonium (metals), nor give a strong persistent yellow tinge to a spirit or air-gas flame (Sodium).

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., Swed., Swiss, and U.S.; not in Norw.)

**Medicinal Properties.**—Antiseptic; it is used as a **dressing** for granulating and suppurating surfaces in general; as an **eye-wash,** 2 to 5 grains in an ounce of Water; as a **lotion** or as a **mouth-wash,** 10 to 15 grains to an ounce of Water; as a **paint** for the throat, 1 in 5 of Glycerine; as a **pessary,** 10 grains with Gelatine Mass or Oil of Theobroma.

**Dose.**—5 to 30 grains.

Contained in Ung. Conii.

### Preparation.

### UNGUENTUM ACIDI BORICI.

Boric Acid in fine powder, 1; Soft Paraffin, 4; Hard Paraffin, 2; melt the Paraffins together, and sift the Boric Acid over the surface of the liquid, then stir together until cold. =(1 in 7).

The commercial "Pulv. Subtil" contains so many coarse particles that for use it should be passed through a fine lawn sieve.

Sifting the powder over the surface of the Paraffins is unnecessary and inconvenient.

(Dan., Dutch and Swiss, 1 in 10; not in the other Pharmacopœias.)

### Not Official.

**LINTEUM ACIDI BORICI.**—Lint dipped in a hot saturated aqueous solution of Boric Acid and then dried. Should contain 50 p. c. of Boric Acid, and not be scaly. It is sometimes coloured pink.

Used as an antiseptic dressing for wounds and ulcers.

**Boric Gauze,** 25—40 p. c.; **Boric Wool,** 40 p. c.

**PASTILLUS ACIDI BORICI** (*T.H.*).—2 grains in each pastil.

**BORO-GLYCERIDE.**—A patent preparation for preserving different kinds of food. It is made by heating together Boric Acid and Glycerine.

A **solution,** 1 in 20 of Water, has been used as an antiseptic in operative surgery.

**LIQUOR MAGNESII BORATIS.**—*Light* Carbonate of Magnesium, 4; Boric Acid, 27; Water, 128; boil and filter. Dissolves almost completely, but crystallises out within 48 hours. Half the quantity of Light Calcined Magnesia can be used in the place of the Carbonate.

Has been recommended in diphtheria.—*B.M.J.* '87, ii. 526.

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## ACIDUM CARBOLICUM.

### CARBOLIC ACID.

*B.P.Syn.*—PHENIC ACID; PHENOL; PHENIC ALCOHOL.

$HC_6H_5O$, eq. 94.

An acid obtained from Coal-tar Oil by fractional distillation and subsequent purification.

Carbolic Acid, or Phenol, is prepared in a crude state by treating certain oils, heavier than water, obtained in the distillation of Coal Gas Tar, with a dilute solution of caustic Soda, subsequent separation of the crude Carbolic Acid from the alkaline solution by the addition thereto of a mineral Acid (usually Sulphuric). The crude Carbolic Acid thus obtained is submitted to fractional distillation and crystallisation, with other purification processes, having for their object the entire removal of the last traces of Cresylic and other Tar Acids and Bases, Sulphur compounds, &c.

A Synthetic Acid has also been prepared, and is now found commercially of very good quality.

In separate pulverulent crystals having a peculiar taste and odour or in acicular crystalline masses. Colourless, or having a very slight reddish or brownish tinge. Sp. g. at the melting point 1·060—1·066. At 60° F. (15·5° C.) 100 parts of the Acid are liquefied by the addition of 5 to 10 parts of Water; dissolve 30 to 40 of Water, and are dissolved by 1800 to 1200 of Water; the former and latter of these numbers being respectively characteristic of the acicular and pulverulent varieties of the acid. The aqueous solution should be clear and colourless, or nearly so; any insoluble brown matter separating as dark oily drops which should not have more than a faint tarry odour.—*British Pharmacopœia*, 1885.

Pure Carbolic Acid, when freshly prepared, fuses at 108° F. (42·25° C.), and boils at 359·6° F. (182° C.); 100 parts dissolve in 1200 parts of Distilled Water at 60° F.; 100 parts will dissolve 36 parts of Water at 60° F.

When 1 or 2 parts of melted Carbolic Acid are mixed with 1 of Water, the Acid separates on cooling in oily-like globules; but when 3, 4, 5, 6, 7, 8, and even 9 of Acid to 1 of Water are mixed, the solution is perfect at ordinary temperatures; when, however, the temperature sinks to 40° F. or under, the 8 and the 9 will crystallise out again.

Pure Carbolic Acid readily absorbs Water from the air, and combines with it to form a definite Crystalline Hydrate $2C_6H_6O.H_2O$, containing 8·74 per cent. of Water and melting at 63° F. (17·2° C.)—*Allen.*

**Melting Point.**—Should not be lower than 91·5° F. (33° C.)—*British Pharmacopœia.*

Of several commercial samples examined by us in 1885, not one melted below 95° F., and the majority above 100° F. It is difficult to understand the reason for lowering the standard of B.P. 1867 (m. p. 95°) to m. p. 91·5 in B.P. 1885.

As a commercial article at a low price can be obtained with a melting point not lower than 100° F. (37·8° C.), the melting point of the Pharmacopœia should be raised accordingly.

It is possible with special precautions to raise the melting point of Carbolic Acid to 108° F., but the highest melting point now commercially obtainable appears to be about 106° F., and no exception can be taken to a melting point of 104° F.

**Melting Point** (Centigrade) compared with foreign Pharmacopœias:

Austr. and Swed., 37°—40°; Belg., 41°; Brit., 33°; Port. and Span., 35°; Dan., 38°; Dutch, 39°—42°; Fr., 42°; Ger., 40°—42°; Hung., 35°—44°; Ital. (Fenolo Crystallizzato), 40°; Norw., 35°—42°; Russ., 40°—42°; Swiss, 42°; U.S. not lower than 35°. It will be noticed that the B.P. standard is lower than any other Pharmacopœia.

**Boiling Point.**—Should not be higher than 371° F. (188·3° C.)—*British Pharmacopœia.*

This limit should be lowered to 184° C. (363·2° F.).

**Boiling Point** (Centigrade) compared with foreign Pharmacopœias:

Austr., 182°—184°; Belg. and Ital., 182°; Brit., under 188·3°; Dan., 178°—180°; Dutch, Port., and Swed., **b.p.** not given; Fr., 187°—188°; Ger. and Russ., 178°—182°; Hung., 180°—184°; Norw., 180°; Span., 186°; Swiss, 183°; U.S., not higher than 188°.

**Melting Point** and **Boiling Point** are influenced by presence of Water or Cresylic Acid, so that to eliminate the first, it should be boiled for a few seconds and cooled.

Starting with an Acid melting at 104° F., one per cent. of added Water reduced the Melting Point to 98° F., 3 per cent. to 86° F., and 5 per cent. to 74° F.

Lunge has shown that the addition of 1·3 p. c. of Cresylic Acid to pure Phenol reduces the Melting Point from 40·5° C. to 32·5° C.—*P.J.* xxii. 593.

The *lower* the Melting Point and the *higher* the Boiling Point, the more impure is the Acid. The pure Acid melts at 42° C. and boils at 182° C.

**Solubility.**—1 in 13 (or a little less) of Water; 1 in 2 of Olive Oil; 3½ in 1 of Glycerine; 3 in 1 of Chloroform; 4 in 1 of Ether; 6 in 1 of Rectified Spirit; 2¼ in 1 of Benzol; 2½ in 1 of Bisulphide of Carbon; freely in Liquor Potassæ and Liquor Sodæ; freely in Volatile Oils.

**Tests.**—It coagulates Albumen; it does not redden Litmus, and does not affect a ray of polarised light; neutral solution of Perchloride of Iron strikes a deep purple colour, and Bromine Water gives a white precipitate with a cold saturated aqueous solution of Carbolic Acid. Solution of Ammonia and of Chlorinated Soda produce a deep purple colouration, especially after a time.

The principal tests for the quality of Carbolic Acid are the odour, which is characteristic, the melting point, boiling point, and the solubility in water.

**Medicinal Properties.**—Antiseptic, disinfectant, and local anæsthetic. Used in the utensils in sick rooms, also to wet a sheet hung outside the door of an infected chamber. Given as a sedative to check sickness and flatulence, to arrest diarrhœa, to remove intestinal worms; useful in some stages of phthisis; for psoriasis, 3 grs. in water three times a day are taken, the itching being greatly relieved. It has been used with advantage in hooping cough, internally as well as by inhalation, also as a disinfectant, sprinkled about the room. Placed in a carious tooth or cautiously applied to the gum, relieves tooth-ache. Used as a **paint** for the throat (1 to 4 of Glycerine); as a **gargle** (2 grs. to 1 oz.) for sore throat attended with fœtor of breath; if used with a **spray apparatus,** 3 grains in an ounce of Water; or for **inhalations,** 20 grs. dissolved in a pint of hot Water; as an **injection** (1 gr. to 1 oz. of Water) for the vagina or the bladder, to correct putrescence. Externally, used alone is a powerful caustic; as a **lotion** (15 to 30 grs. to 1 oz.) for foul or syphilitic ulcers, carbuncles, scabies, and lepra; (5 grs. to 1 oz.) excellent for eczema and eruptions attended with itching; or an **ointment** (30 to 60 grs. to 1 oz. of Benzoated Lard). For a **mouth-wash,** *see* Phenate de Soude, pp. 19 and 20.

**Carbolised Oil,** 1 or 2 in 40 of Olive Oil; used for dressing scalds and burns, to relieve the pain.

**Carbolised Solution,** 1 or 2 in 40 of Water; used in surgery as an antiseptic.

2 per cent. solutions have been used for **hypodermic injection.**

As solutions of Carbolic Acid in strong Alcohol or concentrated Glycerine are not caustic, but become so when diluted with Water, it is suggested that in cases of burning with concentrated Carbolic Acid it would be better to remove the Acid with strong Alcohol rather than with Water.—*P.J.* xix. 783.

Actual contact would appear to be necessary for Carbolic Acid to act as a germicide. A few inches from the surface of pure Carbolic Acid in a bottle (open to the air) putrefaction and fermentation goes on as rapidly as in the open air.—*P.J.* ii. 545.

Carbolic Acid mixed with 5 to 10 per cent. of Glycerine injected for hydrocele.—*B.M.J.* '86, i. 1164, 1214.

Two per cent. spray for erysipelas.—*B.M.J.* '86, ii. 947.

Injection of a 5 p. c. solution for Anthrax.—*B.M.J.* '86, ii. 601; *L.* '87, ii. 1186; *L.M.R.* '89, 422.

One grain in 1 oz. of water every four hours for vomiting in pregnancy.—*L.* '89, i. 1121.

**Dose.**—1 to 3 grains in pill twice or three times a day.

Ph. Ger. maximum single dose, $1\frac{1}{2}$ grains; maximum daily dose, $7\frac{1}{2}$ grains.

12 grs. of Carbolic Acid makes a good pill mass with 24 grs. of Liquorice Powder; another good formula is, Carbolic Acid 12 grs., Liquorice Powder 18 grs., Compound Tragacanth Powder 6 grs.

The addition of free Ammonia to solution of Carbolic Acid slowly turns the colour blue, which darkens on keeping.—*P.J.* xxi. 593.

**Antidotes.**—Stomach-pump, Emetics. Albumen, Saccharated Solution of Lime, soluble Sulphates (Magnesium or Sodium); Olive or Castor Oil; stimulants to counteract narcotism; warmth to the extremities. Hypodermic injection of Sulphate of Atropine $\frac{1}{60}$ grain. Inhalations of Nitrite of Amyl.

Case of Carbolic Acid poisoning by absorption treated successfully with 1 grain doses of Camphor dissolved in Syrup every hour for 4 times.—*L.M.R.* '84, 217. Recovery after swallowing 3 oz. Carbolic Acid, treated by hypodermic injection of $\frac{1}{10}$ grain Apomorphine, Olive Oil and Lime Water being given freely.—*B.M.J.* '88, i. 1336; Soap.—*L.* '89, ii. 445.

## Preparations.

### ACIDUM CARBOLICUM LIQUEFACTUM.

Carbolic Acid liquefied by the addition of 10 per cent. of Water. A colourless or very slightly reddish or brownish liquid, having the taste, odour, &c., of Carbolic Acid.

Sp. g. 1·064—1·067 at 60° F. (15·5° C.), boiling point gradually rising to a temperature not higher than 371° F. (188·3° C.).

It dissolves 18 to 26 per cent. of Water (at 60° F.), yielding a clear, or nearly clear, solution, from which any slight coloured impurity contained previously in the Acid separates as dark oily drops.—*Brit. Pharm.*

When a small quantity of solution—say 2 fluid-drachms in a test-tube, with a thermometer dipping into the solution—is cooled to about 45° F. and gently stirred, it becomes a mass of crystals, which will entirely disappear when the temperature rises to 55° or 56° F. (13° C.).

This test was given in our earlier editions for the Liquid Carbolic Acid *containing* 10 p.c. of water, and made from an Acid melting at 104° F.

(Austr., Ger., and Hung. Pharm., Carbolic Acid, 100; Water, 10. Dan. and Swiss, Carbolic Acid, 90; Water, 10. Dutch, Carbolic Acid, 100; Water, 20.)

### GLYCERINUM ACIDI CARBOLICI.

Carbolic Acid, 1; Glycerine, 4: rub together till dissolved.

Sp. g. about 1·223. =(By weight 1 in 6, by measure 1 in 5).

**Dose.**—5 to 10 minims in water.

(U.S., 1 in 5; Port., 1 in 100; Span., 1 in 120; not in the others.)

Mixed with an equal bulk of water, may be applied to the tonsils when turgid, or when there is a diseased state of mucous surface producing fœtor of breath; also in diphtheria, assisted by a nutritious diet.

### SUPPOSITORIA ACIDI CARBOLICI CUM SAPONE.

Carbolic Acid, 12 grs.; Curd Soap in powder, 180 grs.; Glycerine of Starch, 40 grs., or a sufficiency; to be divided into 12 conical suppositories. Each suppository will contain 1 grain of Carbolic Acid.

The mass does not melt at 212° F.

(Not in the foreign Pharmacopœias.)

### UNGUENTUM ACIDI CARBOLICI.

Carbolic Acid, 1; Soft Paraffin, 12; Hard Paraffin, 6; melt and stir together constantly until cold. =(1 in 19).

The Carbolic Acid does not dissolve in the melted mixture till it reaches a temperature of 140° F. Part of the Carbolic Acid crystallises in the Ointment on keeping, and acts as a caustic. This will not occur if the strength be reduced to 1 in 30.

(U.S., Carbolic Acid, 1; Ointment, 9. The latter is made with 4 parts of Lard and 1 of Yellow Wax; not in the others.)

## Not Official.

**ACIDUM CARBOLICUM CRUDUM.**—A yellowish, yellowish brown, or reddish brown liquid, having a strongly empyreumatic and disagreeable odour. It consists chiefly of Cresylic Acid, and is largely used for disinfecting drains, &c.

(Belg., Hung., Ital., Russ., Swed. and U.S.; not in the others.)

**LOTIO ACIDI CARBOLICI.**—Carbolic Acid, 30 grs.; Water, 8 oz. This lotion applied to mosquito bites relieves the itching, pain, and swelling. If mixed with a little Glycerine and sponged over the face and hands before retiring to rest, the mosquitoes will not bite until the Acid be thoroughly evaporated by the heat of the skin.—*L.* '78, ii.

(Fr. (Soluté d'Acide Phenique), and Port. (Agua Phenica), 1 in 100, also 1 in 1000; Austr. and Ger. (Aqua Carbolisata), 1 in 33; Hung. (Aqua Carbolata), and Russ. (Acidum Carbolicum Solutum), 1 in 100; Dan. and Norw. (Solutio Acidi Carbolici), and Swed. (Solutio Acidi Phenylici), 1 in 50; Span. (Agua Fenicada), 1 in 250.)

**MISTURA ACIDI CARBOLICI** (Rothe).—Pure Carbolic Acid, 12 mins.; Tincture of Iodine, 16 mins.; Tincture of Orange, 90 mins.; Syrup, 3 drms.; Water to 8 oz. Recommended for use in Typhoid Fever; 1 oz. every four hours.—*L.* '88, i. 1244.

**OIL FOR CATHETERS** (Lund's Oil modified).—Pure Carbolic Acid or Phenol, 1; Castor Oil, 4; Almond Oil, 15.—*Univ. Coll. Hosp.*

A solution of Carbolic Acid in Oil is frequently used to lubricate and at the same time disinfect catheters; but Koch's experiments show that such a solution has no antiseptic power, and they ought to be first disinfected with an aqueous solution, and afterwards oiled.—*Brunton*, p. 816.

**TROCHISCI ACIDI CARBOLICI** (*T. H.*)—1 grain Carbolic Acid in each lozenge. One for a dose four or five times daily as an antiseptic and stimulant.

**CARBOLIC ANTISEPTIC DRESSINGS.**—Absorbent **Wool** and **Lint** containing 7 per cent. of Absolute Phenol; **Gauze,** 11½ p. c.; **Tow,** 10 p. c.; **Ligatures,** 16 p. c.; **Protective** Oiled Skin, 5 p. c.; Lac **Plasters,** 33⅓ p. c.; Silk **Sutures,** 5 p. c.

**SOLUTION DE PHENATE DE SOUDE.**—(Fr. and Span.).—Phenol, 70; Solution of Caustic Soda (sp. g. 1·332), 100; Water to measure, 1000. All by weight.

One part of this solution to 30 of Water makes a good **antiseptic mouth-wash.**

The following formula is given (*A.J.P.* '90, 169) as representing the proprietary article sold under the name "Phenol Sodique":—Coal-tar, 2 troy ounces; Soda, 120 grains; Water sufficient to make one pint.

**LIQUOR NATRI CARBOLICI.**—(Russ.).—Carbolic Acid, 5; Caustic Soda, 1; Distilled Water, 4. Sp. g. 1·060—1·065.

**PHENOL-CAMPHOR.**—Carbolic Acid and Camphor will form a liquid in any proportion between Camphor 3, Carbolic Acid 1—and Camphor 1, Carbolic Acid 3; but most authorities appear to use an excess of Camphor. The formula $C_8H_{11}O$, attributed to this compound, corresponds with molecular weights of each, Carbolic Acid and Camphor (Carbolic Acid 2 parts and Camphor 3 parts).

A colourless refractive liquid with an odour of Camphor. Soluble in Rectified Spirit, Ether, Chloroform, and oils. Insoluble in Glycerine and in Water.

Used as a local anæsthetic for toothache.—*T.G.* '85, 269; *L.* '89, ii. 867.

It is not so caustic as Carbolic Acid.

Carbolic Acid, 1, Camphor, 3, has been applied to false membranes in diphtheria, &c., either pure or mixed with an equal volume of Oil of Almonds.

It may be used at first every two hours, and afterwards three or four times a day. —*Bulletin de Thérapeutique*; also *B.M.J.* '88, i. 490.

Subcutaneous and intrapulmonary injections in Phthisis.—*L.M.R.* '88, 518.

**PHENOL IODATUM** (*Hosp. Women*).—Iodine, 40 grs.; Liquefied Carbolic Acid, 1oz.

A fluid drachm diluted with 20 oz. of Water is used as a vaginal douche in midwifery.—*L.* '88, ii. 862.

Under the name **Iodised Phenol**, a solution of Iodine 1, in Liquid Carbolic Acid 4 (by weight) has been applied on cotton to the uterus for cancer.—*B.M.J.* '80, i. 471.

Solution (in a bottle or flask) is assisted by a gentle heat under 200° F.; but separation takes place on cooling. With 5 of Liquid Carbolic Acid the solution is permanent.

**TRIBROMPHENOL.** *Syn.* Bromol.—White crystalline powder, with a slightly aromatic odour. A sample tested melted at 185° F. (85° C.).

**Solubility.**—1 in 2 of Rectified Spirit; 1 in 1 of Ether; 1 in 2 of Chloroform; almost insoluble in Water, but dissolves in Caustic Alkaline Solutions; 1 in 260 of Glycerine; 1 in 7½ of Olive Oil.

It possesses considerable antiseptic properties.

**TRICHLORPHENOL.**—White crystalline powder, with a pungent, somewhat tarry odour.

**Solubility.**—1 in 1 of Rectified Spirit; 2 in 1 of Ether; 1 in 1¼ of Chloroform; 1 in 1000 of Water; 1 in 9 of Glycerine; 1 in 3 of Olive Oil.

It forms Salts with Ammonium, Potassium, Magnesium, Calcium, and Lead.

It is stated to be an antiseptic and deodorant twenty-five times stronger than Carbolic Acid.

**SULPHOCARBOLIC ACID** ($H.C_6H_5SO_4$) is formed by the action of Sulphuric Acid upon Carbolic Acid.—Gmelin's "Chemistry," vol. xii. 1857. *P.J.* i. 52.

A few years ago this was revived under the name **ASEPTOL**, a syrupy liquid, mixing in all proportions with Water, Alcohol, and Glycerine.

**SULPHOCARBOLATES OF AMMONIA**, of **MAGNESIA**, of **POTASH**, and of **SODA**, all crystallise in tufts of acicular crystals more or less white; **SULPHOCARBOLATE OF COPPER**, in transparent light blue interlacing prisms; of **IRON**, in small brown micaceous crystals; of **ZINC**, in transparent rectangular colourless plates.

The Sulphocarbolates of Sodium and Zinc are now official. *See* SODII SULPHOCARBOLAS AND ZINCI SULPHOCARBOLAS.

## ACIDUM CHROMICUM.

CHROMIC ACID.

*B.P.Syn.*—Chromic Anhydride.

$CrO_3$, eq. 100·5.

This anhydride may be obtained by adding strong Sulphuric Acid to Bichromate of Potassium. It occurs in crimson-red needles, and is very deliquescent.

If made by the B.P. process, it is certain to contain heavy traces of Sulphuric Acid; but when free from Sulphuric Acid, it is only slowly deliquescent in dry air.—*P.J.* xvii. 685.

**Solubility.**—About 2 in 1 of Water; Alcohol decomposes it.

It is a powerful oxidising agent, and is liable to cause sudden combustion or *explosion* in contact with strong Alcohol, Glycerine, and some other oxidisable substances.

**Test.**—1 or 2 grains dissolved in 2 or 3 ounces of Water should afford only a faint opalescence with Chloride of Barium.

The only chemical test is to limit Sulphuric Acid to traces. The above B.P. test is interfered with by the precipitation of Barium Chromate; to make the test workable about 5 p. c. of Hydrochloric Acid should be added to the solution before the Chloride of Barium.

In the Belgian Pharmacopœia the Chromic Acid is first reduced to a green Chromic Salt, by boiling with Hydrochloric Acid and a little Alcohol, before adding the Barium Solution.

(Austr., Belg., Dan., Fr., Ger., Hung., Port., Russ., Span., Swiss, and U.S. Not in Dutch, Ital., Norw., or Swed.)

**Medicinal Properties.**—It is a powerful caustic (1 in 1 of Water), and is used in the French hospitals by means of a glass rod, great care being taken to protect the adjacent parts by plaster or ointment, having moist lint ready to absorb any superfluous Acid; 100 grs. to 1 oz. Water is used to remove warty excrescences; 1 in 8 of Water may be applied to indolent ulcers, and 1 in 2000, or even 4000, is used to wash putrid sores, cancers, &c., so powerful are its antiseptic properties.

It is of great importance for its use as a caustic that Chromic Acid should be free from Sulphuric Acid.

A warm concentrated solution rapidly dissolves all animal tissues.

5 p. c. Solution of Chromic Acid applied with a brush to the feet after bathing gave excellent results in the German Army as a remedy for excessive perspiration.—*P.J.* xx. 504.

### Preparation.

LIQUOR ACIDI CHROMICI.

Chromic Acid, 1; Distilled Water, 3; dissolve. =(1 in 3½).

An orange red, inodorous, caustic, strongly acid liquid.

Sp. g. 1·185. Contains (by weight) 25 per cent. of Chromic Anhydride, $CrO_3$, or 29·5 per cent. of real Chromic Acid, $H_2CrO_4$.

(Belg., Fr., and Span.—Chromic Acid, 1; Distilled Water, 1; dissolve. Sp. g. 1·470.)

**ACIDUM CHRYSOPHANICUM.** *See* CHRYSAROBINUM.

## ACIDUM CITRICUM.

### CITRIC ACID.

$H_3C_6H_5O_7.H_2O$, eq. 210.

A colourless crystalline acid obtained from Lemon Juice, or from the Juice of the fruit of *Citrus Bergamia*, the Lime.

**Solubility.**—10 in 6 of Water; 1 in 2 of Glycerine; 10 in 15 of Rectified Spirit; 1 in 50 of Ether; almost insoluble in Benzol and Chloroform.

It is stated in B.P. that the crystals are soluble in half their weight of boiling water, and in U.S.P. that they melt at 212° F. (100° C.) in their own water of crystallisation, no added water being necessary.

The Melting Point of Citric Acid is rather a variable figure. The fully hydrated Acid melts at about 70° C., and the anhydrous Acid at 153° C., but the crystals and more particularly the powder begin to dehydrate even below 70° C., so that intermediate figures will be obtained according to the manner in which it is heated.—*P.J.*, xxi. 1,051.

**Tests.**—70 grains dissolved in Water require for neutralisation 1000 grain-measures of the volumetric solution of Soda. It leaves no ash when burned with free access of air. Its aqueous solution is not darkened by Sulphuretted Hydrogen, and gives no precipitate when added in excess to a solution of Acetate of Potassium, or of Chloride of Barium—indicating absence of Tartaric and Sulphuric Acids; if the solution be sparingly added to cold Lime Water, it does not render it turbid—absence of Oxalic and Tartaric Acids.

Absence of a dark colour on addition of Sulphuretted Hydrogen to the aqueous solution is no proof of the absence of Lead.

Both the crystals and powdered Citric Acid are very liable to contain particles of Metallic Lead, which do not dissolve in water but are soluble in solutions of Alkaline Citrates. When they are not distinctly visible at the bottom of a watery solution, nearly neutralise with Ammonia, and after standing for an hour add an equal volume of Suphuretted Hydrogen water.

When Lead is present in the Acid, it is sure to be found in the Liquor Ammonii Citratis made from it; if the Acid be dissolved in Water, and filtered before adding the Ammonia, the Lead present as metal is removed.

23 grains dissolved in 1 oz. hot water will dissolve 15 grains of Carbonate of Magnesium, but not 16 grains.—*Proctor.*

Tests for the presence of Tartaric Acid in Citric Acid. (*See* Acidum Tartaricum).

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Refrigerant; allays thirst, and irritation of the skin.

Citric Acid, 1, dissolved in Distilled Water, 11, is a substitute for Lemon Juice, but does not keep long without spoiling.

| | | | | |
|---|---|---|---|---|
| 17 grs. of Citric Acid | neutralise about | 24¼ | grs. | Bicarbonate of Potassium |
| | | 20 | ,, | Carbonate of Potassium. |
| | | 20½ | ,, | Bicarbonate of Sodium. |
| | | 34¾ | ,, | Carbonate of Sodium. |
| | | 12¾ | ,, | Carbonate of Ammonium. |
| | | 11¾ | ,, | Carbonate of Magnesium. |

Prescribed in powders to be taken with each dose of an alkaline mixture during effervescence; or in solution, directing the quantity to be taken with the alkaline mixture.

**Dose.**—10 to 30 grs. in a wineglassful of Water.

**Incompatibles.**—Tartrate of Potassium, Alkaline Carbonates, Acetates, and Sulphurets.

Contained in Ammonii Citratis Liquor Fortior, Bismuthi Citras, Bismuthi et Ammonii Citratis Liquor, Caffeinæ Citras, Ferri et Ammonii Citras, Ferri et Quininæ Citras, Lithii Citras, Potassii Citras, Sodii Citro-Tartras Effervescens, Succus Limonis, Syrupus Limonis, Vin. Quininæ, and in all the granular effervescing Citrates.

### Not Official.

**SYRUPUS ACIDI CITRICI.**—*Syn.* Syrupus Citri.

Belg.—Citric Acid, 20; Syrup, 960; Water, 20; Spirit of Lemon, 1.
Fr.—Citric Acid, 10; Syrup, 980; Water, 10.
Hung.—Citric Acid, 2; Sugar, 100; Water, 50.
Port.—Citric Acid, 1; Syrup of Lemons, 98; Water, 1.
Russ.—Citric Acid, 3; Syrup 150; Elaeosacchari Citri, 1.
Swed.—Citric Acid, 1; Syrup, 19.
Swiss.—Citric Acid, 2; Sugar, 64; Spirit of Lemon, 1·5; Water, 33.
U.S.—Citric Acid, 10; Water, 10; Spirit of Lemon, 10; Syrup to make 1,000.

All by weight except U.S.

### Not Official.

## ACIDUM CRESYLICUM.

CRESYLIC ACID. CRESOL.

$C_7H_8O$ eq. 108.

A colourless or slightly yellow liquid, with a tarry odour. Sp. g. 1·048. It boils, when pure, at 203° C., but a good commercial sample may boil 10° lower. It does not crystallise at the freezing-point of water. Its aqueous solution gives a *transient* blue colour with Solution of Perchloride of Iron.

There are three isomeric Cresols, but the principal constituent of the "crude Carbolic Acid" of Commerce (the source of commercial Cresylic Acid) is the Para-Cresylic Acid, with more or less of its isomers.—*Allen.*

**Solubility.**—1 in 80 of Water, and mixes in all proportions with Rectified Spirit, Ether, Chloroform, Glycerine and Olive Oil.

**Medicinal Properties.**—Used as an **inhalation** in whooping cough.

Antiseptic and slightly caustic; superior to Carbolic Acid and much less poisonous.—*L.M.R.* '88, 447.

By the same process which yields Salicylic Acid from Phenol, the three isomeric Cresols yield three corresponding Cresotic or Cresotinic Acids, the Soda Salts of which have been used in Medicine. *See also Acidum Salicylicum.*

The following is understood to be the composition of the various proprietary preparations of which Cresol is the basis:—

**JEYE'S FLUID** and **JEYE'S CREOLIN.**—This is also sold on the Continent and in America as **PEARSON'S CREOLIN.** Tar Oils, consisting largely of Cresols, saponified with Resin and Alkali. It forms an opaque emulsion with Water.

**ARTMANN'S CREOLIN.**—A solution of tar hydrocarbons in Sulpho-Cresylic Acid. It forms a turbid liquid with Water.

**LYSOL.**—Tar Oils saponified without Resin, and not emulsifying with Water.

**SAPROL.**—Tar Oils dissolved in large excess of Hydrocarbons. Inflammable.

**SOLUTOL.**—Sodium Cresylate in excess of Cresol, powerfully disinfectant but caustic, and not intended for Surgical purposes.

**SOLVEOL.**—Cresols in Sodium Cresotate, soluble in Water. Non-caustic and used for Surgical purposes.

## ACIDUM GALLICUM.

### GALLIC ACID.

$H_3C_7H_3O_5.H_2O$, eq. 188.

Crystalline in acicular prisms or silky needles, sometimes nearly white, but generally of a pale fawn colour. When dried at 212° F. (100° C.), it loses 9·5 per cent. of its weight.

Prepared from Galls by the hydration of the Tannic Acid contained in them. B.P. 1867 effected this by the influence of a ferment during six weeks, but now the process is completed in half an hour, by boiling with Diluted Sulphuric Acid.

**Solubility.**—1 in 100 of cold Water; 1 in 3 of boiling Water; 1 in 8 of Rectified Spirit; 1 in 50 of Ether; 1 in 5 of Glycerine, or with heat, 1 in 4; Gallic Acid, 1, Citrate of Potash, 1, dissolve in 30 of Water.

A solution in Rectified Spirit would be a convenient form for keeping it, as it will mix in any proportion with Water without separating; but it becomes brown by keeping.

**Tests.**—Its aqueous solution reddens Litmus, and gives a bluish-black precipitate with a persalt of Iron; it gives no precipitate with Solution of Gelatine (absence of Tannic Acid). It leaves no residue when burnt with free access of air (absence of earthy matters).

There are several colour-tests for Gallic Acid, but the best is Young's (*C.N.* xlviii, 31, and *Y.B.P.* '84, 153). The addition of Cyanide of Potassium gives an intense red colour, which fades on standing, but is reproduced by shaking energetically in a half-full test-tube, so as to aërate the liquid. All commercial samples of Tannic Acid may be shown to contain small quantities of Gallic Acid, and in some the quantity is fairly large.

(Belg., Dan., Fr., Ital., Port., Span. (Acido Agallico), Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Astringent; given in all cases where the bleeding vessels must be reached through the circulation; it is considered by some to be more effective than Tannic Acid. It is given in pyrosis and the night sweats of phthisis, and is very effective in albuminuria.

**Dose.**—2 to 10 grs., with twice its weight of Sugar, to be taken three times a day in Water, in powders, or may be folded in wafer-paper; 10 to 60 grs. every five hours in albuminuria, when the urine is of low specific gravity. It is also given in **pills:** 30 grs. of Acid and 3 minims of Glycerine will make 6 pills.

**Incompatibles.**—Spiritus Ætheris Nitrosi, Metallic Salts.

### Preparation.

### GLYCERINUM ACIDI GALLICI.

Gallic Acid, 1; Glycerine, 4; rub together and dissolve by a gentle heat, not exceeding that of a water-bath. =(By weight 1 in 6, by measure 1 in 4½).

Sp. g. about 1·3.

**Dose.**—10 to 60 minims.

(Not in the foreign Pharmacopœias.)

On dilution with Water the Gallic Acid crystallises out. With one-tenth of its volume of Water no separation took place in 4 days, but with one-fifth of its volume Crystals began to separate within 24 hours, and finally became almost solid.

Professor Thorpe has shown that Gallic Acid, when heated with Glycerine to 190°—200° C. (374°—392° F.), is rapidly converted into Pyrogallic Acid.

### Not Official.

**UNGUENTUM ACIDI GALLICI.**—Gallic Acid, 1; Benzoinated Lard, 9; rub together.

### Not Official.

## ACIDUM HYDRIODICUM.

This Acid is best prepared and kept in the form of a 20 p.c. solution (sp. g. 1·17), by passing Sulphuretted Hydrogen through four parts of Water containing one part of Iodine. The action is rather slow at first, but becomes more rapid as more Iodine is dissolved by the Hydriodic Acid formed, till the absorption becomes very rapid. When the solution is colourless, the excess of Sulphuretted Hydrogen may be boiled off and the liquid filtered from separated Sulphur.

The Acid, though colourless when first made, rapidly decomposes, even in diffused light, with liberation of Iodine, but may be readily decolourised by warming with a small proportion of Hypophosphorous Acid; 60 minims to 4 oz. is usually sufficient even for a highly coloured Acid.

**SYRUPUS ACIDI HYDRIODICI.**—Colourless Hydriodic Acid (20 p.c.), 3½ oz.; Distilled Water, 8 oz.; Simple Syrup, sufficient to make up the measure to 80 oz.

An acid syrupy liquid, colourless, or of a pale straw tint. Sp. g. 1·300.

Contains 1 per cent. of absolute Hydriodic Acid, HI.

**Dose.**—20 to 40 minims, well diluted.

(U.S.; not in the other Pharmacopœias.)

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# ACIDUM HYDROBROMICUM DILUTUM.

### DILUTED HYDROBROMIC ACID.

A colourless and odourless liquid, containing 10 per cent. by weight of gaseous or real Hydrobromic Acid, **HBr**, eq. 81.

Most commercial samples become coloured on keeping.

Many processes for the preparation of this acid have been recommended.

The original process of Fothergill (*B.M.J.*, '76, ii. 42):—℥ x. ʒ vi. gr. xxviii. Bromide of Potassium dissolved in 2 pints of Water; ℥ xiii. ʒ i. gr. xxxvii. Tartaric Acid in 2 pints of Water; mix the solutions, and filter.

The objection to this process is that not being distilled it contains some quantity of Acid Tartrate of Potassium, and therefore cannot be readily tested for strength either by specific gravity or volumetrically by Solution of Soda.

That adopted by the B.P. consists in passing Sulphuretted Hydrogen through Bromine and Water, filtering from separated Sulphur, and distilling to free the liquid from the Sulphuric Acid which is always formed during the reaction.

It has been recommended to add a little Bromide of Potassium, previous to distillation, to prevent any free Sulphuric Acid from passing over, and Fletcher points out (*P.J.* xv. 537) that it is a mistake to filter before distilling.

Squibb's process is to pour diluted Sulphuric Acid into a strong solution of Bromide of Potassium, separate the liquid from the crystalline Sulphate of Potassium, and distil. That of French Codex is to mix diluted Sulphuric Acid with a strong solution of Bromide of Barium, filter from Sulphate of Barium and distil.

**Dose.**—15 to 60 minims in Water.

**Tests.**—Sp. g. 1·077. The addition of Nitrate of Silver solution causes a white precipitate, insoluble in Nitric Acid, and sparingly soluble in Solution of Ammonia. When mixed with Chlorine Water, Bromine is liberated. When volatilised by heat, it should leave little or no residue. It should not precipitate with Chloride of Barium (absence of Sulphuric Acid). 810 grains by weight require for neutralisation 1000 grain-measures of the volumetric Solution of Soda.

1 fl. oz. should form a clear solution with 27, but not with 29, grains of Carbonate of Magnesium.—*Proctor*.

(Fr., Swiss and U.S. 10 per cent., sp. g. 1·077; not in the others.)

**Medicinal Properties.**—Same as the Bromides. When a large dose or continued use is indicated, it can be used to supplement or replace the Bromides. It is stated to be less likely to produce acne.

Dr. Fothergill stated that it prevents headache after taking Quinine or Iron, and may be given with Quinine (which it readily dissolves) for nervous exhaustion.

**Dose.**—(B.P.) 15 to 50 minims, but larger doses may be given, 2 to 4 fluid drachms, well diluted with water, or syrup and water.

60 minims = $8\frac{2}{3}$ grains of Bromide of Potassium in the quantity of Bromine.

## ACIDUM HYDROCHLORICUM.

### HYDROCHLORIC ACID.

*N.O.Syn.*—Acidum Muriaticum purum; Chlorhydric Acid; Spirit of Salt.

A nearly colourless liquid, containing about 32 per cent. by weight of Hydrochloric Acid gas, $HCl$, eq. 36·5.

The Pharmacopœia method of preparation is by decomposition of Common Salt with a diluted Sulphuric Acid, and absorption of the evolved Gas in Water. Sublimed Ammonium Chloride in lumps has been recommended as being more manageable than Salt, unless the latter be previously fused.

As, however, the Acid is obtained commercially in enormous quantities in the Alkali manufacture, the necessity for making it on a small scale is not likely to arise.

The Crude Acid made with Pyrites Vitriol is generally yellow, and contains considerable traces of Iron and Arsenic. Even the best Brimstone Vitriol does not yield an Acid perfectly free from Arsenic, so that for delicate testing, as in toxicological cases, a specially purified Acid must be used. If 100 parts of Hydrochloric Acid be distilled with Ferrous Chloride, the whole of the Arsenic will pass over in the first 30 parts of distillate, and the subsequent distillate will be Arsenic free.—*C.D.*, '84, 628.

**Tests.**—Sp. g. 1·160. 114·8 grains by weight, diluted with ½ oz. of Distilled Water, require for neutralisation 1000 grain-measures of the volumetric Solution of Soda. When volatilised by heat it should leave no residue. With Nitrate of Silver a curdy white precipitate is formed, insoluble in Nitric Acid, but soluble in excess of Ammonia. When diluted with four times its volume of Distilled Water, it gives no precipitate with Chloride of Barium, nor with Sulphuretted Hydrogen, and does not tarnish bright copper-foil when boiled with it—indicating absence of Sulphuric Acid, heavy Metals, and Arsenic. If a drop or two of dilute Solution of Sulphate of Indigo be added to half an ounce of the Acid, the latter should acquire a permanent blue tint (absence of Chlorine and Nitric Acid).

For the detection of Sulphurous Acid, *see* under ACIDUM ACETICUM, page 7.

1 fl. dr. diluted to 1 oz. will dissolve 26, but not 28, grains of Carbonate of Magnesium.—*Proctor.*

(Austr., 23·86 p. c., sp. g. 1·120; Belg., Port., and Span., sp. g. 1·180; Dutch, 25 p. c., sp. g. 1·126; Fr., 34·4 p. c., sp. g. 1·171; Dan., Ger., Hung., Norw., Russ., Swed. and Swiss, 25 p. c., sp. g. 1·124; Ital., 35·7 p. c., sp. g. 1·18; U.S. 31·9 p. c., sp. g. 1·163.)

**Medicinal Properties.**—Given in a very diluted form, as a refrigerant and tonic; applied with an equal quantity of Water to diphtheritic patches in the throat.

Given with good results in chlorosis.—*L.M.R.* '81, 229.

**Incompatibles.**—Salts of Silver and Lead, Tartar Emetic, Alkalies, and their Carbonates.

**Antidotes.**—In cases of poisoning by Hydrochloric Acid, the antidotes are Chalk, Magnesia, Bicarbonate of Potassium, with White of Egg, Carron Oil, or Soap-suds, followed by Enemata of Beef Tea and Brandy, with Tincture of Opium to prevent collapse; and Emollient Drinks.

Used in the preparation of Acidum Nitro-hydrochloricum Dilutum, Apomorphinæ Hydrochloras, Cocainæ Hydrochloras, Liquor Antimonii Chloridi, Liquor Arsenici Hydrochloricus, Liquor Ferri Perchloridi Fortior, Quininæ Hydrochloras and Syrupus Ferri Subchloridi.

### Preparation.

### ACIDUM HYDROCHLORICUM DILUTUM.

Hydrochloric Acid, 8; Distilled Water sufficient to make the mixture, when cooled to 60° F., measure 26½; or 3060 grains by weight of Acid, and Distilled Water sufficient to measure 20 oz. when cooled to 60° F. (15·5° C.).

Contains 10·58 per cent. of real Acid.

**Test.**—Sp. g. 1·052. Six fluid drachms (345 grains by weight) require for neutralisation 1000 grain-measures of the volumetric solution of Soda, indicating one molecular weight in grains (36½) of Hydrochloric Acid, $\mathbf{HCl}$.

Three and a third minims contain about 1 minim strong Acid.

**Dose.**—10 to 30 minims with aromatic or bitter infusions; for children, 1½ to 2 mins.; 1 drm. in 8 oz. of Infusion of Roses or Decoction of Cinchona as a gargle for ulcerated sore throat and thrush.

Used in the preparation of Liquor Morphinæ Hydrochloratis and Liquor Strychninæ Hydrochloratis.

(Austr. and Dutch, 12·4 p. c., sp. g. 1·062; Belg. sp. g. 1·040; Dan., Hung., Norw., Swed., Swiss and U.S., 10 p.c., about sp. g. 1·049; Ger., 12·5 p.c., sp. g. 1·061; Ital., 7·3 p.c., sp. g. 1·036; Russ., 8·2 p.c., sp. g. 1·040; not in the others.)

## ACIDUM HYDROCYANICUM DILUTUM.

### DILUTED HYDROCYANIC ACID.

*N.O.Syn.*—Prussic Acid; Cyanhydric Acid.

Hydrocyanic Acid, **HCN**, eq. 27, dissolved in Water, and constituting 2 per cent. by weight of the solution.

Prepared by distilling a mixture of Ferrocyanide of Potassium and diluted Sulphuric Acid; special precautions being taken to prevent escape of the vapour.

When only a small quantity is wanted occasionally, it may be convenient to prepare it extemporaneously from dry Cyanide of Silver, as in U.S.P. Cyanide of Silver, 6 parts; Diluted Hydrochloric Acid (B.P.), 15 fluid parts; Distilled Water, 45 parts. Shake for a short time and filter. The product should contain 2 p. c. HCN.

Colourless, with a peculiar odour. It only slightly and transiently reddens Litmus.

It should be kept in well-corked bottles, tied over with impervious tissue. The bottles should be inverted when not in use, and be kept in a dark place.

**Tests.**—Sp. g. ·997. 100 grains (or 110 minims) precipitated with a solution of Nitrate of Silver, and the precipitate thoroughly washed and dried, should yield ten grains of dry Cyanide of Silver. 270 grains (by weight) of the Acid, to which Solution of Litmus is added, rendered alkaline by the addition of Solution of Soda, and maintained faintly alkaline throughout the operation—which should be performed speedily, so as to prevent loss of acid by volatilisation—require the addition of 1000 grain-measures of the volumetric solution of Nitrate of Silver before a permanent precipitate begins to form, which corresponds to 2 per cent. of real Acid.

B.P. directs that the operation of titration should be performed quickly, but Proctor points out that *after* the Acid has combined with the Alkali, it is no longer liable to evaporate. Two examinations of the same Acid, one performed speedily and the other purposely exposed to the air for half an hour after the addition of the Alkali, gave identical results. It is the earlier operation of weighing, &c., that should be performed as quickly as possible.

This latter test is that of Liebig. The addition of the Soda to the Prussic Acid produces Cyanide of Sodium, and this would precipitate a Cyanide of Silver on the addition of Silver Nitrate, were it not for the fact that one equivalent of Cyanide of Silver combines with one equivalent of Cyanide of Sodium to form a compound soluble in Water and unacted upon by Alkali; it is only when more Silver is added than is necessary to form this double Cyanide, that a permanent precipitate of Silver Cyanide is produced.

Treated with a minute quantity of a mixed solution of Sulphate and Persulphate of Iron, afterwards with Potash, and finally acidulated with Hydrochloric Acid, it forms Prussian Blue. No fixed residue is left after evaporation of 60 minims of this Acid. It gives no precipitate with Chloride of Barium, but with Nitrate of Silver it gives a white precipitate entirely soluble in boiling concentrated Nitric Acid—indicating absence of Sulphuric and Hydrochloric Acids.

We understand that manufacturers purposely add a trace of Hydrochloric Acid to retard decomposition; such a sample would consequently redden Litmus permanently, and the precipitate with Nitrate of Silver will be partially insoluble in boiling Nitric Acid.

U.S.P. volumetric process of estimation with Magnesia, Chromate of Potassium, and Nitrate of Silver, reckons as Cyanide any Chloride which may be present.

(Belg., 2·5 per cent.; Fr., Acide Cyanhydrique Dissous, 1 p. c.; Norw., 2 p. c.; Port., strength not given; U.S., 2 per cent.; Span., 10 p. c.; not in the others. *See also* Aqua Amygdalæ Amaræ.)

**Medicinal Properties.**—As this Acid is a dangerous poison, it should never be prescribed alone.

It is sedative, antispasmodic, allays vomiting, is useful in gastrodynia, and in dyspeptic palpitations. Used externally to allay itching of the skin when unbroken; as a **lotion** 2 drms. to 8 oz. of Rose Water and Glycerine; as an **ointment** from $\frac{1}{2}$ drm. to 1 drm. to each ounce of Zinc Ointment.

The vapour is sometimes applied to the eye, but it is more generally used as a sedative inhalation in the cough of laryngeal phthisis and in some spasmodic affections.

Prescribed in Almond Emulsion for cough, and with Bicarbonate of Sodium, Carbonate of Bismuth, and Peppermint Water for dyspepsia.

**Dose.**—2 to 8 minims.

**Incompatibles.**—Salts of Silver, Copper, Iron, Red Oxide of Mercury, Sulphurets.

**Antidotes.**—In cases of poisoning, the antidotes are fresh air and artificial respiration, with cold affusion; freshly precipitated Oxide of Iron, with an Alkaline Carbonate, thus, 10 grs. of Sulphate of Iron, with a drachm of Tinct. of Iron and 1 oz. of Water, followed by 20 grs. of Carbonate of Potassium dissolved in 1 oz. of Water. This will render insoluble 110 minims of Br. Ph. Acid. Stimulants—Ammonia and Brandy; Hypodermic injection of Atropine, $\frac{1}{60}$ grain.

Used in the preparation of Tinctura Chloroformi et Morphinæ.

### Preparation.

#### VAPOR ACIDI HYDROCYANICI.

Diluted Hydrocyanic Acid, 10 to 15 minims; cold Water, 60 minims; mix in a suitable apparatus, and let the vapour that arises be inhaled.

### Not Official.

**ACIDUM HYDROCYANICUM** (Scheele) *B.P.C.*—A colourless liquid. Sp. g. ·994. It should contain 4 per cent. HCN, when estimated by volumetric solution of

Nitrate of Silver; should give no precipitate with Chloride of Barium, but with Nitrate of Silver a white precipitate entirely soluble in boiling concentrated Nitric Acid.

**Dose.**—1 to 4 minims.

The only practical use for a double strength acid is to poison dogs or cats.

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Not Official.

## ACIDUM HYDROFLUORICUM.

An aqueous solution of Hydrofluoric Acid Gas obtained by passing into water the gas produced by the action of Sulphuric Acid on Fluor Spar.

The commercial acid thus obtained is redistilled for therapeutic use.

The redistilled acid contains about 30 per cent. of the gas; it is usually stored in gutta-percha bottles, owing to its action on glass.

Great caution must be used in handling this Acid, as contact with the liquid or gas may result in sores difficult to heal, or permanent destruction of tissue; no pain is felt until the injury is beyond remedy.

Inhalations have been tried in phthisis.—*L.* '86, ii. 1046; '88, i. 1224; '89, i. 496; *B.M.J.* '88, i. 758, 933.

### Preparation.

**ACIDUM FLUORICUM DILUTUM** (*T. H.*)—A half per cent. solution of the Redistilled Acid.

**Dose.**—20 to 60 minims.

Recommended as an adjunct, in the treatment of bronchocele.

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Not Official..

## ACIDUM HYPOPHOSPHOROSUM.

$H_3PO_2$, eq. 66.

Dissolve 8 oz. of Hypophosphite of Barium (containing not less than 95 per cent. $Ba\ 2(PH_2O_2)\ H_2O$) in 36 fluid ounces of hot distilled water. Add slowly to the solution 17 fluid oz. of Diluted Sulphuric Acid, after which continue the addition, drop by drop, until no further turbidity is produced. Set aside in a warm place, and pass the clear liquid through a filter. Wash the precipitate by decantation with successive portions of hot distilled water, until the washings have no longer an acid reaction. Filter, unite the filtrates, and evaporate the liquid in a water-bath to the prescribed density. The product will weigh about 11½ oz.

Colourless. Sp. g., 1·1367. Its strength as determined by volumetric Solution of Soda, corresponds to 30 per cent. of Hypophosphorous Acid. Its aqueous solution is not precipitated by diluted Sulphuric Acid, nor by an excess of Ammonia, nor by Oxalate of Ammonium after neutralisation, and gives not more than a faint opalescence with Chloride of Barium. If Solution of Ammonio-Sulphate of Magnesium be added after an excess of Ammonia, no precipitate is produced. Chloride of Calcium added to a neutralised Solution yields no precipitate.

The above process, characters and tests are taken from B.P.C. The process is better than that previously given, viz., the treatment of Hypophosphite of Lime with Oxalic Acid. But at the present moment a pure Hypophosphorous Acid is a commercial desideratum.

Heated with excess of Solution of Perchloride of Mercury and a little Hydrochloric Acid to 100° C. (212° F.), Calomel is precipitated, from the weight of which the percentage of Hypophosphorous Acid may be calculated.—*P.J.*, xvii. 773.

As the reaction follows the equation $H_3PO_2 + 4HgCl_2 + 2H_2O = H_3PO_4 + 4HgCl + 4HCl$, 100 parts of Calomel produced are equivalent to 7 parts of Anhydrous Acid.

Used in the manufacture of the Solution and Syrup of Hypophosphite of Iron, &c.

# ACIDUM LACTICUM.

LACTIC ACID.

A colourless, inodorous, syrupy liquid, with a pure acid taste, and acid reaction on Litmus, containing about 75 per cent. of $HC_3H_5O_3$, eq. 90. It is produced by the action of a peculiar ferment on Solution of Sugar and subsequent purification of the product.

It titrates much better with Phenol-Phthalein than with Litmus.

**Solubility.**—It is miscible in all proportions with Water, Rectified Spirit, and Ether, but nearly insoluble in Chloroform.

**Tests.**—Sp. g. 1·210. 120 grains require for neutralisation 1000 grain-measures of the volumetric Solution of Soda. Warmed with Permanganate of Potassium, it gives the odour of Aldehyd. It vaporises when heated, and yields inflammable gases when the temperature is about 350° F. (176·7° C.), at first burning with a blue flame, which becomes more luminous as the temperature rises. When nearly all dissipated the residue chars, and finally almost entirely disappears. A solution in about 10 parts of Water, neutralised by Ammonia, is not precipitated by Sulphide of Ammonium (absence of Lead and Iron). Not more than a faint opalescence is produced with Chloride of Barium (Sulphates), Nitrate of Silver (Chlorides), or Oxalate of Ammonium (Calcium), nor when boiled with excess of Fehling's Solution is any precipitate formed (absence of Sugars).

B.P. volumetric test and sp. g. do not quite agree.

(Belg., Fr., Port., and Span., sp. g. 1·215; Austr., Dan., Ger., Russ., and Swiss, sp. g. 1·21—1·22; U.S. (75 p.c.) sp. g. 1·213; not in the others.)

**Medicinal Properties.**—It is used as a **spray** in diphtheria, 1 part to 16 parts of Water.

The concentrated Acid has been employed on absorbent wool in the treatment of lupus.

## Preparation.

### ACIDUM LACTICUM DILUTUM.

Lactic Acid, 3; Distilled Water sufficient to produce 20.

**Tests.**—Sp. g. 1·040. 700 grains by weight require for neutralisation 1000 grain-measures of the volumetric Solution of Soda.

**Dose.**—30 to 120 minims.

In infantile diarrhœa teaspoonful doses of a 2 per cent. solution of Lactic Acid.—*L.* '88, i. 292, *T.G.* '87, 480.

## Not Official.

**SYRUPUS CALCII LACTOPHOSPHATIS** (U.S.).

Precipitated Calcium Carbonate, 25; Lactic Acid (sp. g. 1·213), 60; Phosphoric Acid (sp. g. 1·710), 36; Orange Flower Water, 25; Sugar, 700; Water a sufficiency to make 1,000. To the Lactic Acid, mixed with 100 of Water, and contained in a capacious mortar, gradually add the Calcium Carbonate, in portions, until it is dissolved. Then add the Phosphoric Acid, and triturate until the precipitate at first formed is dissolved. Add 150 of Water, and filter, rinsing the mortar with 75 of Water, and passing the rinsings through the filter. To the mixed filtrates add the Orange Flower Water, and, having added the Sugar, dissolve it by agitation, without heat, and strain. Lastly, pass enough Water through the strainer to make the product measure 1,000, and mix thoroughly.

In this country it is more usually flavoured with lemon.

(Fr. Codex contains 1·25 per cent. by weight of Bicalcic Phosphate.)

(U.S. contains about 2 per cent. by weight of Tricalcic Phosphate.)

## ACIDUM MECONICUM.

MECONIC ACID.

$H_2C_7H_2O_7.3H_2O$, eq. 254.

An Acid obtained from Opium in micaceous crystals.

**Solubility,** 1 in 150 of Water; it is decomposed by boiling water; 1 in 45 of Rectified Spirit.

**Tests.**—It is coloured red by neutral solution of Perchloride of Iron, the colour being discharged by strong but not by diluted Hydrochloric Acid. The aqueous solution gives no precipitate with solution of Iodine and Iodide of Potassium (absence of Alkaloids).

Used only to prepare the *Official* Liquor Morphinæ Bimeconatis.

## ACIDUM NITRICUM.

NITRIC ACID.

*N.O.Syn.*—Azotic Acid.

Colourless. Contains 70 per cent. by weight of real Acid, $\mathbf{HNO_3}$, eq. 63.

5 measures of Anhydrous Acid, $HNO_3$, sp. g. 1·500, and 2 of Water mixed, condense into 6½ measures of the Hydrate $2HNO_3$, $3H_2O$, sp. g. 1·420.

**Tests.**—Sp. g. 1·420. Boiling Point 250° F. (121° C.). If submitted to distillation the product continues uniform throughout the process. 90 grains by weight, mixed with half an ounce of distilled Water, require for neutralisation 1000 grain-measures of the volumetric Solution of Soda. When evaporated to dryness, it leaves little or no residue. If it be poured upon copper filings, dense red fumes are immediately formed, but if the acid be mixed with an equal volume of Water, and then added to the copper, it gives off a colourless gas, which acquires an orange-red colour as it mixes with the air, and which if it be introduced into a solution of Sulphate of Iron, communicates a dark purple or brown colour. Diluted with six volumes of distilled Water, it gives no precipitate with Chloride of Barium or Nitrate of Silver—indicating absence of Sulphuric and Hydrochloric Acids.

As acid of the strength indicated in the test exercises a preventive influence on the precipitation of Barium Sulphate, a large excess of Barium Chloride must be used. If only a few drops of $BaCl_2$ solution be added, even 2 p.c. of $H_2SO_4$ may escape detection; but if excess of Barium be used ¼ p.c. of $H_2SO_4$ produces an almost immediate turbidity.

A delicate and useful reaction for the detection and estimation of small quantities of Nitric Acid, applicable to Water analysis, is described *P.J.* xxi. 1176.

(Austr., sp. g. 1·300; Belg., sp. g. 1·330; Dan., Norw., and Swed., sp. g. 1·180; Dan. also Acidum Nitrico-nitrosum, sp. g. 1·48—1·50; Dutch, sp. g. 1·317; Fr., sp. g. 1·390; Ger. and Swiss, sp. g. 1·153; Hung., sp. g. 1·310; Ital., sp. g. 1·400; Port., sp. g. 1·300—1·330; Russ., sp. g. 1·200; Span., sp. g. 1·321; Swiss, also Acidum Nitricum Fumans, sp. g. 1·45—1·5; U.S., sp. g. 1·414.)

**Medicinal Properties.**—It is strongly corrosive, and is applied as a **caustic** to warts, phagedænic sores and chancres by means of a pointed glass rod. When diluted it is refrigerant, tonic, and antiseptic; and if very much diluted forms a drink in febrile diseases, and is used also as an injection in phosphatic calculus. Thirty minims in ten ounces of Water is an excellent **lotion** for bleeding piles.—*Ringer.*

**Incompatibles.**—Alcohol, Alkalies, Carbonates and Sulphurets, Sulphate of Iron, Acetate of Lead.

**Antidotes.**—In case of poisoning by Nitric Acid, the antidotes are Chalk, Magnesia, or Carbonated Alkalies, with White of Egg, Carron Oil, or Soap-suds, followed by Enemata of Beef Tea and Brandy, with Tinct. of Opium to prevent collapse; emollient drinks.

Used in the preparation of Acidum Nitrohydrochloricum Dilutum, Acidum Phosphoricum Concentratum, Argenti Nitras, Bismuthi Carbonas, Bismuthi Subnitras, Hydrargyri Oxidum Rubrum, Liquor Ferri Perchloridi Fortior, Liquor Ferri Pernitratis, Liquor Ferri Persulphatis, Liquor Hydrargyri Nitratis Acidus, Pilocarpinæ Nitras, Unguentum Hydrargyri Nitratis.

### Preparation.

### ACIDUM NITRICUM DILUTUM.

Nitric Acid, 6; Distilled Water sufficient to make the mixture, when cooled to 60° F. (15·5° C.), measure 31; or 2400 grains by weight of Acid, and Distilled Water sufficient to measure 20 oz. when cooled to 60° F. (15·5° C.).

Colourless. Contains 17·44 per cent. of real Acid.

**Test.**—Sp. g. 1·101. Six fluid drachms (361·3 grains by weight) require for neutralisation 1000 grain-measures of the volumetric solution of Soda, corresponding to one molecular weight in grains (63) of real Acid, $HNO_3$.

**Dose.**—10 to 30 minims diluted with Water. For children 1½ min.

5 minims contain about 1 minim of strong Acid.

Prescribed with bitter infusions and Tincture of Orange.

(Austr., sp. g. 1·129; Belg. and Dutch, sp. g. 1·12; Hung., sp. g. 1·067; Ital. sp. g. 1·077; Russ., sp. g. 1·096; Swiss, sp. g. 1·056; U.S., sp. g. 1·057; not in the others. Dan., Norw. and Swed., *see* Acidum Nitricum.)

Used in the preparation of Ammonii Nitras and Cupri Nitras.

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## ACIDUM NITRO-HYDROCHLORICUM DILUTUM;

DILUTED NITRO-HYDROCHLORIC ACID.

Nitric Acid, 3; Hydrochloric Acid, 4; Water, 25. Add the Acids to the Water, and keep the mixture in a glass-stoppered bottle for fourteen days before it is used.

According to B.P. it is colourless, contains free Chlorine, Hydrochloric, Nitric and Nitrous Acids, and other compounds dissolved in Water; but as a matter of fact scarcely any action takes place between the diluted acids, free Chlorine and Nitrous Acid existing only in *traces.*

The strong acids mixed and diluted after three days, liberated about fifty times as much Iodine from Iodide of Potassium as the B.P. preparation.

**Test.**—Sp. g. 1·070. 6 fluid drachms (352 grains by weight) require for neutralisation about 883 grain-measures of the volumetric Solution of Soda.

16 minims equal 1½ minim of Nitric Acid and 2 minims of Hydrochloric Acid.

U.S., orders the undiluted—Nitric Acid, 18; Hydrochloric Acid, 82; also the diluted—Nitric Acid, 4; Hydrochloric Acid, 18; Water, 78.

Norw., Nitric Acid, 1; Hydrochloric Acid, 2. By weight.

Russ., and Swiss, Nitric Acid, 1; Hydrochloric Acid, 3. By weight.

Fr., Eau Regale—Nitric Acid, 8; Water, 2; Hydrochloric Acid, 30. By weight.

Dublin Pharmacopœia was—Nitric Acid, 1; Muriatic Acid, 2.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—Tonic, stomachic, and alterative. Externally as a **lotion** or **bath,** for obstructions of the liver.

*Is an hepatic stimulant of considerable power.—Dr. Rutherford.*

**Dose.**—5 to 20 minims in 1½ oz. Water, and for children 1 min. with Succus Taraxaci; when diluted with Water it goes well with Tincture of Gentian or Tincture of Orange.

**Incompatibles.**—Alkalies, Carbonates, Sulphurets, Salts of Silver and Lead.

**Antidote.**—Albumen freely administered, after evacuating the stomach.

*Directions for Preparing and Using the Bath.*

Mix 8 ounces by measure of Diluted Nitro-hydrochloric Acid with 1 gallon of Water, temperature 96° or 98° F. Let a flannel roller* of ten or twelve inches wide, and sufficient to encircle the body twice, be soaked in the fluid and then wrung, so as to remain only damp. Apply this instantly to the body, covering it with a piece of oiled silk to avoid damping the dress. It should be worn constantly, but should be changed, soaked, and wrung, morning and evening. Glass, glazed earthenware, or wooden vessels should be used. Sponges and towels to be kept in Water to prevent them corroding.

## ACIDUM OLEICUM.

### OLEIC ACID.

A fluid fatty Acid, $HC_{18}H_{33}O_2$, eq. 282, usually not quite pure, obtained by the saponification of Olein, or by the action of superheated steam on fats, with subsequent separation from solid fats by pressure.

A straw-coloured liquid nearly odourless and tasteless and with not more than a very faint acid reaction; unduly exposed to air it becomes brown and decidedly acid.

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* These, with the oiled silk attached, can be had of the chemists ready-made.

Sp. g. 0·860—0·890. It becomes semi-solid at 40° to 41° F. (4·5° to 5° C.), melting again at 56° to 60° F. (13·3° to 15·5° C.).

The above is B.P., but Allen gives the sp. g. ·897, which agrees with the best commercial samples. These froze at 33° F. (·5° C.), and cleared again at 42°—45° F. (5·5°—7·2° C.).

**Solubility.**—Mixes in all proportions with Alcohol, Chloroform, Ether, Benzol, Oil of Turpentine, and fixed oils. Insoluble in Water.

**Tests.**—It should be completely saponified when warmed with Carbonate of Potassium; and an aqueous solution of this salt neutralised by Acetic Acid, and treated with Acetate of Lead, should yield a precipitate, which after washing with boiling water is almost entirely soluble in Ether (absence of more than traces of Palmitic and Stearic Acids).

This B.P. test does not work satisfactorily, except with precautions not there indicated, owing to the liability to precipitate lead compounds insoluble in Ether, also the difficulty of *neutralising* a soap solution which of itself is alkaline to most indicators.

A much simpler method is to dissolve the Oleic Acid in a small quantity of Alcohol, add a drop of Phenol-Phthalein Solution, and then Caustic Alkali, till a red colour just appears, dilute with Water, and precipitate in the cold with the smallest possible excess of Lead Acetate. After the precipitate has agglomerated, wash with boiling Water, rinse with cold Alcohol, and dissolve finally in *pure* Ether.

A good sample should dissolve with only a slight turbidity.

The U.S.P. test for fixed oils (equal volumes of Acid and Alcohol) will not detect an admixture with 20 per cent. of Olive Oil.

(U.S., sp. g. ·900. Not in the other Pharmacopœias.)

Used in pharmacy for dissolving Oxide of Mercury, Oxide of Lead, Oxide of Zinc, and the alkaloids Morphine, Aconitine and Atropine.

Oleatum Hydrargyri and Oleatum Zinci are now Official and will be found under their respective metallic headings.

Not Official.

## ACIDUM OSMICUM.

OSMIC ACID.

$OsO_4$, eq. 262·5.

A pale yellow crystalline substance giving off an excessively irritating vapour, which attacks the eyes and nose.

Chiefly used as 1 per cent. **aqueous solution** for fixing and staining in histological work. Fat and nerve substances are blackened by it. The solution should be carefully preserved from dust, as it is readily reduced (blackened) by small quantities of organic matter.

4 to 6 mins. of a 1 p. c. **aqueous solution** of Osmic Acid or Osmate of Potassium have been injected hypodermically for sciatica and other forms of neuralgia. —*L.M.R.* '85, 414.

Should not be dissolved in Alcohol or Ether, as decomposition ensues.

Not Official.

## ACIDUM OXALICUM.

$H_2C_2O_4, 2H_2O$.

This is noticed here rather as a poison than a medicine, although it has been used medicinally in America in the treatment of amenorrhœa, and as a sedative in acute cystitis (*T.G.* '91, 164) in ½ gr. doses every four hours. It is used in households for cleaning brasses, and removing ink-stains, iron-moulds, &c. It has been mistaken for Epsom Salts, which it somewhat resembles. Murrell states that death has occurred from two drachms, but recovery from half an ounce.

**Antidotes.**—Chalk, Lime, or Whitening are given freely in Water. Saccharated Solution of Lime may be given in drachm doses frequently repeated, and followed by Castor Oil as a purgative.

As a reagent for Lime, and a standard Acid for titration of alkalies, it appears in the Appendix.

## ACIDUM PHOSPHORICUM CONCENTRATUM.

CONCENTRATED PHOSPHORIC ACID.

A colourless syrupy liquid, containing Phosphoric Acid, $H_3PO_4$, eq. 98, with 33·7 per cent. of Water.

It is convenient to remember that one part by volume of B.P. Acid is practically equal to one part by weight of $H_3PO_4$.

Phosphoric Acid is manufactured by the direct oxidation of Phosphorus by Nitric Acid. The Phosphorus may be used in the amorphous condition, or a small quantity of Iodine may be added to act as a "carrier" in the process.

The strongest commercial Acid has a sp. g. 1·75, but it may be concentrated to 1·85 without formation of Metaphosphoric or Pyrophosphoric Acids; from Acid of the latter strength, crystals of pure Phosphoric Acid $H_3PO_4$ may readily be obtained.—*P.J.* xii. 371.

**Tests.**—Sp. g. 1·5. 73·8 grains by weight mixed with 180 grains of Oxide of Lead in fine powder leave, by evaporation, a residue (principally Phosphate of Lead), which after it has been heated to dull redness weighs 215·5 grains. Evaporated, it leaves a residue which melts at a low red heat, and upon cooling exhibits a glassy appearance. When diluted with Water, it gives a canary-yellow precipitate with Ammonio-nitrate of Silver, soluble in Ammonia and in Diluted Nitric Acid (as is the case also with aqueous Solution of Arsenious Acid); it is not precipitated by Sulphuretted Hydrogen passed through the hot solution for a few minutes, nor by Chloride of Barium, Nitrate of Silver acidulated with Nitric Acid, or by a solution of Albumen—indicating absence of metals (particularly Arsenic), Sulphuric Acid, Hydrochloric Acid, and Metaphosphoric Acid. If neutralised by Ammonia and then a slight excess of Acetic Acid added, Oxalate of Ammonium does not immediately cause turbidity. When diluted and mixed with an equal volume of Solution of Perchloride of Mercury and heated, no precipitate is formed. When mixed with an equal volume of pure Sulphuric Acid, and then introduced into a Solution of Sulphate of Iron, it does not communicate to it a dark colour—indicating absence of Nitric Acid.

The percentage acidity of Phosphoric Acid is conveniently determined by titration with standard Alkali, using Phenol-phthalein as an indicator; the change of colour takes place when two-thirds of the Hydrogen is replaced by Alkali-metal. With Methyl-orange as the indicator, neutrality is reached with half this quantity of Alkali. With Litmus the end reaction is too indefinite.

When made alkaline with Ammonia it should not give (even after long standing) a crystalline precipitate of Ammonio-Magnesian Phosphate (indicating absence of Magnesium, which is present to a considerable extent in some commercial samples).

(Austr., sp. g. 1·094 (16·66 p. c.); Belg., Fr. and Ital., sp. g. 1·35 (50 p. c.); Dutch, sp. g. 1·153 (25 p. c.); Ger. and Russ., sp. g. 1·154 (25 p. c.); Hung., sp. g. 1·120 (20 p. c.); Port., sp. g. 1·880; Span., sp. g. 1·454; U.S., sp. g. not below 1·710 (85 p. c.); not in the others.)

Used to prepare Syrupus Ferri Phosphatis and in several non-official formulas.

## Preparation.

### ACIDUM PHOSPHORICUM DILUTUM.

Contains 13·8 per cent. by weight of Phosphoric Acid, $\mathbf{H_3PO_4}$, eq. 98, corresponding to 10 per cent. of Phosphoric Anhydride, $\mathbf{P_2O_5}$, eq. 142.

Concentrated Phosphoric Acid, 3; Distilled Water sufficient to make 20: mix.

Diluted Phosphoric Acid may be prepared from a concentrated Phosphoric Acid of any strength, provided the product have sp. gr. 1·08, and respond to the tests.

**Tests.**—Sp. g. 1·080. 6 fluid drachms (355 grains by weight) mixed with 180 grains of Oxide of Lead (Litharge) in fine powder, leave, after evaporation, a residue which, having been heated to dull redness, weighs 215·5 grains, and is principally Phosphate of Lead.

Six fluid drachms contain in grains (49) one half of the molecular weight of Phosphoric Acid ($\mathbf{H_3PO_4} = 98$); being equivalent in grains (35·5) to one-fourth of the molecular weight of Phosphoric Anhydride ($\mathbf{P_2O_5} = 142$).

For tests of purity *see* Acidum Phosphoricum Concentratum.

(Dan., Norw., Port., and Swed., sp. g. 1·080 (14 p. c.); Russ., (12·5 p. c.); Swiss and U.S., sp. g. 1·057 (10 p. c.); not in the others.)

**Medicinal Properties.**—Tonic and refrigerant, having properties similar to Sulphuric Acid, but more palatable, and it allays tickling cough. Given with Phosphate of Lime in rickets. It is also found useful in cases of vomiting and diarrhœa arising from a bilious attack, if given in frequent doses.

Used as a partial substitute for organic acids in cooling drinks and acidulated waters.

**Dose.**—10 to 30 minims largely diluted with Water; for children 1 to 2 mins.

May be prescribed with some bitter and aromatic tinctures and syrups, or with the Syrup of Phosphate of Iron, but not with the Syrup of Pyrophosphate of Iron as the mixture becomes solid.

**Incompatibles.**—Lime Water, and all alkalies.

Used in the preparation of Ammonii Phosphas.

Not Official.

## ACIDUM PHOSPHORICUM GLACIALE.

METAPHOSPHORIC ACID.

$HPO_3$, eq. 80.

Colourless, transparent, glass-like masses, which absorb moisture from the air, and become liquid; the solution is slowly converted into Orthophosphoric Acid in the cold, and rapidly on boiling.

Commercial Acid contains large quantities of Ammonia, equal in some cases to 40 per cent. of Phosphate of Ammonium.

This has been re-investigated (*P.J.* xxii. 217), with the result that no commercial sample could be found which did not contain such quantities of alkali (Ammonia, Soda, or both) that even the best sample did not contain more than half its weight of free Metaphosphoric Acid $HPO_3$. It is an obsolete preparation and of no use pharmaceutically.

Soluble in Water; the solution coagulates albumen and gives a white precipitate with a salt of Barium.

(Not in the other Pharmacopœias.)

Not Official.

## ACIDUM PICRICUM.

$HOC_6H_2(NO_2)_3$, eq. 229.

PICRIC ACID. CARBAZOTIC ACID. TRINITROPHENOL.

Pale yellow crystalline scales.

With Ammonia, Potash and Soda it forms crystallisable Salts which are explosive.

**Solubility.**—1 in 75 of Water; 1 in 10 of Rectified Spirit.

A saturated aqueous Solution is a delicate test for the presence of Albumen in fluids; even in very dilute Solutions a white cloud is formed at the junction of the two fluids, and in stronger solutions the Albumen is precipitated. Used in histological work. The excise have imposed restrictions as to its sale and storage.

(Fr.; not in the other Pharmacopœias.)

Not Official.

## ACIDUM PYROGALLICUM.

PYROGALLIC ACID. PYROGALLOL.

$C_6H_3(OH)_3$, eq. 126.

Usually prepared by heating Gallic Acid to 185°—200° C.

Professor Thorpe has published an easy and cheap method for making Solution of Pyrogallic Acid, by mixing Gallic Acid and Glycerine, and heating the mixture to 190°—200° C. (not exceeding the latter), so long as bubbles of Carbonic Acid are seen to form in the liquid.—*P.J.* xi. 990.

It occurs in white flaky crystals, which blacken by exposure to light. It colours Ferrous Salts an intense blue, and Ferric Salts a brownish red; with alkalies it becomes brown very quickly on exposure to air.

**Solubility.**—1 in 2 of Water, and measures $2\frac{1}{2}$; 9 in 10 of Rectified Spirit.

Largely used in photography.

1 in 16 of Water is used with a solution of Nitrate of Silver, 1 in 30 of Water, for blackening the hair.

(Austr., Dutch, Fr., Hung., Russ. and Swiss; not in the others.)

**Medicinal Properties.**—A 2 per cent. **solution** in Water acts as an antiseptic. —*B.M.J.* '79, i. 278.

Used in the form of a 10 per cent. **salve,** and applied with a brush twice a day, it proved very useful in Hebra's wards in the treatment of psoriasis. The parts were then covered with cotton wadding or linen, and when very extensive were covered with flannel.—*Pr.* xxv. 377.

Not more than 15 to 25 grains should be used in the 24 hours, as violent toxic symptoms may result from its absorption.—*T.G.* '85, 59.

An **ointment,** Pyrogallic Acid, 40 ; Starch, 40 ; Vaseline, 120 ; also a **powder,** Pyrogallic Acid 20, Starch 80, have been used for venereal ulcers.—*L.M.R.* '82, 228 ; '84, 68.

Mixed with Collodium Flexile, 40 grains to the ounce for psoriasis.—*T.G.* '86, 181.

**UNGUENTUM ACIDI PYROGALLICI** (Jarisch's Ointment).—Pyrogallic Acid, 60 grs.; Lard, 1 oz.: mix.—*British Skin Hospital.*

**UNNA'S PYROGALLIC PLASTER MULL.**—Contains 40 per cent. of the Acid, equal to ½ grain in each square inch of surface.

Not Official.

## ACIDUM PYROLIGNEOSUM CRUDUM.

A brown liquid having an odour of Tar and Acetic Acid, and containing about 6 per cent. of the latter. Deposits a tarry substance on standing for some time.

(Dan., Ger. and Russ. ; not in the others.)

**Medicinal Properties.**—A good antiseptic.

## ACIDUM SALICYLICUM.

### SALICYLIC ACID.

$HC_7H_5O_3$, eq. 138.

Prepared by passing Carbonic Acid into a mixture of Carbolic Acid and Caustic Soda at a high temperature, and decomposing the Salicylate of Sodium with an Acid, and subsequent purification ; or by treating Oil of Winter Green (*Gaultheria procumbens*), which is mainly composed of Salicylate of Methyl, also Oil of Sweet Birch (*Betula lenta*) and *Andromeda leschenaultii* (a native of India), with a solution of Caustic Potash, and distilling it, decomposing the residue with Hydrochloric Acid, and purifying the Salicylic Acid by recrystallisation.

In white acicular crystals, inodorous, but light and easily diffused. The crystals melt at about 311° F. (155° C.), and below 392° F. (200° C.) volatilise without decomposition. The aqueous solution gives with Solution of Perchloride of Iron a reddish-violet colour. An Alcoholic solution allowed to evaporate spontaneously should leave a perfectly white residue.

The discussion on this subject during the last two years may be summarised as follows :—

1. The B.P. characters, in several particulars, are in need of revision.
   (*a*) A distinct separation should be made between the **natural** Acid, which is *not* "white," or "light and easily diffused," and the **artificial** Acid, which is either "puriss" and in large white crystals, or in a less pure "powder" which is light and easily diffused.

(*b*) Salicylic Acid may be sublimed, but there is almost certain to be some slight decomposition with liberation of Phenol.

(*c*) The evaporation test should be done with Water, and not with Alcohol.—*P.J.* xxi. 478.

2. **Artificial Salicylic Acid** is liable to two forms of impurity: (1) Isomers of Salicylic Acid, from overheating during the process of manufacture; (2) Homologues of Salicylic Acid (Cresotates) from the presence of Cresol in the Phenol from which it is made. The latter series alone need be taken into account.

(*a*) There are three Isomeric Cresols—Ortho, Para, and Meta—giving rise to corresponding Acids—Ortho, Para, and Meta-cresotic (or Cresotinic as they are sometimes called) Acids. These much resemble Salicylic Acid, but vary principally in their melting-point and physiological action. Their presence also in Salicylic Acid modifies its properties in a greater degree than might be expected from numerical proportion.

(*b*) Formerly when Salicylic Acid was very impure, the foreign elements were principally Ortho- and Meta-cresotic Acids. Now the only likely impurity is a small quantity of the Para-cresotic Acid.

(*c*) When this impurity is present in fairly large quantity (say 5 p. c.), it is found impossible to produce fine large crystals, but 2 p. c. of the impurity does not materially interfere with crystallisation.

The most definite test is the melting point. Pure Salicylic Acid melts sharply at 156·85° C., and Para-cresotic Acid at 151° C.; but even small percentages of the latter materially reduce the melting point of the Salicylic Acid. It also reduces the *sharpness* of the m. p., causing it to soften at a lower temperature than is required to actually liquefy it.

As a reduction of 1° C. corresponds roughly to 1 p. c. of impurity, the B.P. melting point indicates an Acid containing about 2 p. c. of Para-cresotic Acid.

(*d*) By fractional precipitation of the Sodium Salt by Silver Nitrate and regeneration of the Acid by decomposing the precipitated Silver Salicylate with Hydrochloric Acid, the impurities are all concentrated in the last precipitated portion, so that it is possible in this way to detect very small quantities.

(*e*) One can now obtain commercially an Acid **physiologically pure**, even the last fraction of which has a melting point of 156·85° C.; commercial **crystals** with m. p. of 156·5° to 156·75° C., containing about $\frac{1}{20}$ p. c. impurity, the last 10 p. c. giving a m. p. $\frac{1}{2}$° C. below the maximum; commercial **powder** with an initial melting point of 156·4° C. rising to 156·75° containing about $\frac{1}{10}$ p. c. impurity, the last 10 p. c. giving a m. p. 1° C. below the maximum.

(*f*) **Meta-cresotic Acid** is practically devoid of physiological action.

**Ortho-cresotic Acid** is unquestionably poisonous.

**Para-cresotic Acid.** To this considerable doubt still attaches. Several German physicians, and also one or two in this country, have given large doses of Para-cresotate of Sodium with success in many diseases and find it less poisonous than Salicylic Acid itself.

Dr. Charteris, of Glasgow (whose experiments started the question), found by its action when injected into the circulation of rabbits, that the lethal dose per kilo of body weight was very much less than Salicylic Acid, and particularly so when given in combination with the latter, and hence the importance of its absence from Salicylic Acid intended for internal use.

3. The **natural acid** is preferable to the artificial for internal use.—*B.M.J.* '81, ii. 934; '86, i. 735; '89, ii. 1208. Although this was no doubt true at the dates then given, it is very open to question whether the same statement will apply

to an artificial Acid, which when fractionated has the melting point above attached to "physiologically pure."

**Solubility.**—About 1 in 550, in Water; 1 in 9 of boiling Water; 1 in 15 of Proof Spirit; 1 in $3\frac{1}{2}$ of Rectified Spirit; 1 in 2 of Ether; 1 in 55 of Chloroform; 1 in 120 of Olive Oil; 1 in 195 of Glycerine; 1 in 8 of Lard (at 180° F.). 20 grains Salicylic Acid are rendered soluble in a fluid ounce of Water by the addition of 25 grains of Borax, or 40 grains of Citrate of Potash; but it is better to use Salicylate of Sodium.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

**Medicinal Properties.**—Antiseptic and antipyretic; useful in acute and chronic rheumatism, but generally given in the form of Salicylate of Sodium, as it is more soluble in water and less irritating to the stomach; also in combination with Bismuth Oxide and Lithia.

A good **preservative** of medicated solutions, such as Cocaine Salts and Boric Acid, otherwise liable to fungoid growths; 1 in 1000 is sufficient for the purpose, but in the eye, causes temporary smarting.

Used as a **lotion** (4 per cent.) in pruritus and urticaria, and some forms of eczema; as an **injection** (1 in 300) in the dysenteric diarrhœa of children; as an **ointment** (1 in 6) for pruritus (*Ringer*). With Zinc Oxide and Starch it is used as a **"dusting powder"** for Infants.

**Dose.**—5 to 30 grains.

**Incompatibles.**—Spirit of Nitrous Ether, Iron Salts.

Contained in Liquor Cocainæ Hydrochloratis.

## Preparations.

### UNGUENTUM ACIDI SALICYLICI.

Salicylic Acid, 1; Soft Paraffin, 18; Hard Paraffin, 9: melt the Paraffins, add the Acid, and stir together until cold. =(1 in 28).

(Not in the foreign Pharmacopœias.)

**SALICYLATE OF SODIUM.**—*See* SODII SALICYLAS.

## Not Official.

**UNGUENTUM ACIDI SALICYLICI** (*B.S.H.*).—Salicylic Acid, 30 grs.; Benzoated Lard, 1 oz.; melt over a water-bath and stir till cold.

Used for eczema, psoriasis, ringworm, and for foul ulcers.

**PULVIS SALICYLICUS CUM TALCO**, Ger. and Russ.—Salicylic Acid, 3; Wheat Starch, 10; Talc, 87: mix to a fine powder. Used in the German Army as a preventive against perspiring and sore feet. It is applied dry, on a march daily, in garrison every two or three days. U.S.N.F. substitutes Boric Acid in the place of Wheat Starch.

(Same as Dan., Pulvis Salicylicus Compositus.)

**SALICYLIC ACID SUET.**—Salicylic Acid, 2; Mutton Suet, 100: used in the German Army for sweaty feet and soreness from riding.—*B.M.J.* ii. '85, 219.

**SALICYLIC AND CREASOTE PLASTER MULLS** (Unna).—Contain $\frac{1}{2}$ grain of Salicylic Acid and 1 grain of Creasote to the square inch; also twice this strength. Possess a solvent power on horny epidermis, the Creasote acting as an anæsthetic. Also used in the treatment of lupus.—*L.* '86, ii. 574, and *B.M.J.* '87, ii. 451.

Salicylic Acid and Creasote can also be applied as an ointment with Lard and Wax.

**COLLODIUM SALICYLICUM.**—Salicylic Acid, 30; Extract of Indian Hemp, 5; Flexile Collodion, 240: dissolve.

Useful in the treatment of hard and soft corns.—*P.J.*, xiii. 884.

**SALICYLIC DRESSINGS.**—**Gauze, Lint,** and **Wool,** 4 per cent.; **Jute,** 4 and 10 p. c.; **Lac Plaster,** 33⅓ p. c.

**SALACETOL.**—A compound of Salicylic Acid and Acetone, insoluble in Water, sparingly soluble in Alcohol. It is unaffected by dilute acids, but decomposed by weak alkali with liberation of Salicylic Acid. Introduced as an intestinal disinfectant resembling Salol in its action.

# ACIDUM SULPHURICUM.

## SULPHURIC ACID.

A colourless oily liquid, intensely acid and corrosive; it is produced by the combustion of Sulphur and the oxidation and hydration of the resulting Sulphurous Acid Gas by means of nitrous and aqueous vapours. It contains about 98 per cent. by weight of real Sulphuric Acid, $H_2SO_4$, eq. 98, and boils at about 620° F. (326·6° C.).

Sulphuric Acid exists in two other states: a solid crystalline form, resembling Asbestos, and Nordhausen Acid, a fuming liquid, both of which are used in the arts; the latter has also been employed in the treatment of cancer.

**Tests.**—Sp. g. 1·843.* 50 grains by weight, mixed with an ounce of Distilled Water, require for neutralisation 1000 grain-measures of the volumetric solution of Soda. It evolves much heat on the addition of water, and when thus diluted gives a copious white precipitate with Chloride of Barium. Evaporated in a platinum crucible, leaves little or no residue; when a solution of Sulphate of Iron is poured upon it, no purple ring is formed at the junction of the two solutions—indicating absence of fixed impurities, Nitric and Nitrous Acids. If a few drops be mixed with about a quarter of an ounce of Solution of Stannous Chloride mixed with strong Hydrochloric Acid, and the mixture be heated to boiling and then be allowed to cool, no darkening in colour and no precipitate should be produced—absence of Arsenic.

Sulphate of Lead if present in large quantity precipitates on the addition of Water, but if in small quantity on the further addition of Alcohol.

(In all the Pharmacopœias, ranging from sp. g. 1·835 to 1·845.)

**Medicinal Properties.**—A powerful **caustic**, and when so used it is made into a paste with an equal quantity of charcoal; when **diluted** it is tonic, refrigerant, astringent, exciting the appetite and promoting digestion; it is useful in controlling choleraic diarrhœa; it diminishes night sweating, more particularly when given with Sulphate of Zinc; useful in treating lead colic.

**Incompatibles.**—Alkalies and their Carbonates, Salts of Lead and Lime.

**Antidotes.**—In case of poisoning by Sulphuric Acid, Magnesia is preferred to Chalk. For other antidotes *see* Hydrochloric and Nitric Acids.

Used in the preparation of Acidum Hydrochloricum, Acidum Hydrocyanicum Dilutum, Acidum Nitricum, Acidum Sulphurosum, Æther, Beberinæ Sulphas,

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* True Monohydrated Sulphuric Acid has a sp. g. 1·848.

Chloroformum, Cupri Sulphas, Ferri Sulphas, Ferri Sulphas Granulata, Hydrargyri Persulphas, Liquor Ferri Persulphatis, Quininæ Sulphas, Zinci Sulphas.

## Preparations.

**ACIDUM SULPHURICUM AROMATICUM.** *N.O.Syn.*—ELIXIR OF VITRIOL.

Sulphuric Acid, 3; Rectified Spirit, 36; Spirit of Cinnamon, 2; Strong Tincture of Ginger, 2: mix the Acid gradually with the Spirit, and add the Spirit of Cinnamon and Tincture of Ginger.

**Tests.**—Sp. g. ·911. 195 grains by weight require for neutralisation 500 grain-measures of the volumetric Solution of Soda, corresponding to 12·5 per cent. of real Acid.

The B.P. tests given above are incorrect; they should read sp. g. ·925, and 177 grains require for neutralisation 500 grain-measures of the volumetric Solution of Soda, corresponding to 13·8 per cent. of real Acid.

NOTE.—Brit. Pharm., 1867, ordered the Cinnamon and Ginger in powder and digested the whole for seven days. It made a preparation like the old Elixir of Vitriol, a deep red. The new formula gives a pale orange brown, which will get darker by keeping.

**Dose.**—5 to 30 minims diluted with Water.

(U.S. Sulphuric Acid, 100; Tincture of Ginger, 50; Oil of Cinnamon, 1; Alcohol sufficient to measure 1000: add the Sulphuric Acid gradually and with great caution to 700 of Alcohol and allow it to cool, then add to it the Tincture of Ginger and Oil of Cinnamon, and finally enough Alcohol to make the product measure 1000.)

It is used in the preparation of Infusum Cinchonæ Acidum.

**ACIDUM SULPHURICUM ALCOHOLISATUM.**—*See* Not Official.

**ACIDUM SULPHURICUM DILUTUM.**

Contains 13·65 per cent. by weight of real Acid.

Sulphuric Acid, 7; dilute with 77 of Distilled Water, and when the mixture has cooled to 60° F. add more Water, so that it shall measure 83½; or 1350 grains by weight of Acid, and Distilled Water sufficient to measure 20 oz. when cooled to 60° F.

As great heat is developed in mixing strong Sulphuric Acid and Water, it is always safer to add the Acid to the Water than the Water to the Acid. With Acid 1, Water 1, the temperature rises to 270° F.

**Test.**—Sp. g. 1·094. 6 fluid drachms (359 grains by weight) require for neutralisation 1000 grain-measures of the volumetric solution of Soda, indicating half a molecular weight in grains (49) of real Acid, $H_2SO_4$.

12 minims contain 1 minim of strong Sulphuric Acid.

**Dose.**—5 to 30 minims; for children 1 min.

Prescribed much diluted, in mixtures; or in cough linctuses, with Squill, Poppies, and Syrup of Mulberries; also to dissolve Quinine.

(Austr., Acid 1, Water 4·76, sp. g. 1·12; Ital., Acid 1, Water 4, sp. g. 1·134, Belg., Dutch, Ger. and Russ., Acid 1, Water 5, sp. g. 1·110—1·117, Dan., Norw., and Swed., Acid 1, Water 7, sp. g. 1·081—1·085; Fr., Hung. and Port., Acid 1, Water 9; Span., Acid 1, Water 8; Swiss and U.S., 10 p. c., sp. g. about 1·070; all by weight).

Used in the preparation of Aconitina, Antimonium Sulphuratum, Atropina, Atropinæ Sulphas, Beberinæ Sulphas, and Infusum Rosæ Acidum.

Not Official.

**MYNSICHT'S ELIXIR OF VITRIOL.**—Cinnamon, Ginger, Cloves, each 3; Calamus Aromaticus, 8; Galangal, 12; Sage, 4; Peppermint, 4; Cubebs, 2; Nutmeg, 2; Aloes Wood, 1; Lemon Peel, 1; Sugar Candy, 32; Rectified Spirit, by weight, 144; Sulphuric Acid, by weight, 96. Digest for three weeks.

**Dose.**—5 to 10 minims.

**ACIDUM SULPHURICUM ALCOHOLISATUM. LIQUOR ACIDUS HALLERI. MISTURA SULPHURICA ACIDA. AQUA RABELLI.**

Austr., Belg., Ger., Hung., Port. Russ., Span. and Swiss.—Sulphuric Acid, 1; Alcohol (90 p. c.), 3.

Fr.—Sulphuric Acid, 1; Alcohol (90 p. c.), 3; Poppy Petals, ·04.

Dan., Dutch, Ital., Norw. and Swed.—Sulphuric Acid, 1; Alcohol, 1. All by weight.

## ACIDUM SULPHUROSUM.

### SULPHUROUS ACID.

Sulphurous Anhydride, $SO_2$, eq. 64, dissolved in Water.

A colourless liquid, with a pungent sulphurous odour; contains 5 per cent. by weight of Sulphurous Acid Gas, or Sulphurous Anhydride, $SO_2$; equivalent to 6·4 per cent. of real Acid, $H_2SO_3$.

By passing into Water the pure $SO_2$ obtained by heating Sulphuric Acid and Copper, it is very easy to obtain a solution containing the 9·2 per cent. of the B.P. 1867; but if Charcoal be used in place of Copper, as in the Pharmacopœia process, so much $CO_2$ is given off with the $SO_2$ that it is difficult to obtain a solution much over 5 per cent.

The percentage of $SO_2$ in any solution of the Gas corresponds almost exactly with the decimal figures in the sp. g. divided by 5.—*P.J.* xvi. 211.

Liquid Sulphurous Acid, equal to 500 times its volume of Gas, is now readily obtainable in glass syphons with tap to regulate outflow of Gas; one pound of the liquified Gas is equal to 5½ cubic feet of $SO_2$, which dissolved in Water equals 2 gallons of the B.P. 5 per cent. solution.

**Tests.**—Sp. g. 1·025. It gives but a very slight precipitate with Chloride of Barium, but a copious one if Solution of Chlorine be also added. Evaporated, it leaves no residue. 64 grains (by weight) mixed with 20 oz. of recently boiled and cooled Distilled Water and a little mucilage of Starch do not acquire a permanent blue colour with the volumetric Solution of Iodine, until 1000 grain-measures of the latter have been added.

More correct titration is obtained by adding the Sulphurous Acid to a measured excess of Iodine Solution and titrating back with standard Solution of Hyposulphite. —*Sutton.*

Sulphurous Acid may be expected to contain heavy traces of Sulphuric Acid.—*P.J.* xix. 497.

30 minims of the Acid shaken with ½ fl. oz. of Tincture of Iodine should be about colourless.—*Proctor.*

(Port., Soluto de Gaz Sulfuroso; U.S. sp. g. not less than 1·035 (6·4 p. c.); not in the others.)

**Medicinal Properties.**—It is a powerful deoxidizing agent, disinfectant and antiseptic, and is destructive to vegetable life. Diluted with 1 or 2 parts of Water it is used as a **spray** in diphtheria and ulcerated sore-throat; mixed with equal parts of Glycerine, as an **application** in erysipelas, also for chapped hands and chilblains; as a **lotion**, 1 or 2 drms. to 1 oz. of Water, for wounds, cuts, ulcers, and bed-sores; as an **inhalation** (60° to 100° F.), 60 minims in 20 oz. of Water. Has been given **internally** for scarlet fever and diphtheria; also to prevent flatulence due to fermentation. It destroys parasitic lichen on the skin.

Pfeiffer found that ·5 to 1 per cent. Aqueous Solution caused excessive and extensive gastritis. Even 20 minims largely diluted caused irritation of the digestive organs.—*A.J.P.* '90, 626.

**Dose.**—½ to 1 drm.

**SULPHITE OF SODIUM** and **HYPOSULPHITE OF SODIUM** will be found under "**SODIUM.**"

## ACIDUM TANNICUM.

TANNIC ACID.

*N.O.Syn.*—GALLO-TANNIC ACID.

$C_{27}H_{22}O_{17}$, eq. 618.

An Acid, extracted from Galls. In pale yellow vesicular masses or thin glistening scales.

**Solubility.**—10 in 5 of Water; 10 in 6 of Rectified Spirit; 3 in 1 of Absolute Alcohol; 1 in 3 of Glycerine, or if warmed, 1 in 2; sparingly in Olive Oil; almost insoluble in Benzol and Chloroform.

These solubilities were made with Tannic Acid which was very soluble, but different samples vary in solubility.

Commercial Tannic Acid almost invariably contains some proportion of Gallic Acid, which when dissolving in Water is the last portion to go into solution.

For the solubility of Tannic Acid in Ether *see P.J.* xx. 351.

**Tests.**—The Aqueous Solution precipitates Solution of Isinglass yellowish-white, and the Persalts of Iron of a bluish-black colour. It leaves no residue when burned with free access of air.

For the detection of Gallic Acid, the red colour produced by Cyanide of Potassium is the best reaction.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

**Medicinal Properties.**—Styptic and astringent. 60 grs. in 10 oz. of Rose Water is used as a **spray** for relaxed sore-throat; the same strength is also used as an **injection** in leucorrhœa and in chronic gonorrhœa with advantage. 3 grs. to the ounce is used as a **nasal douche.** 40 grs. to the ounce as an **ointment**. The powder has been used as a **snuff** in epistaxis. Internally for uterine hæmorrhage. For **suppositories** and **pessaries** *see* p. 46.

30 to 60 grs. daily given successfully in fifty cases of acute tuberculosis.—*L.* '86, ii. 1003.

As an injection into nasal polypi.—*L.* '87, i. 543.

Warm Tannin **enemata** were given with success in the cholera at Naples.—*L.* '85, i. 352.

Glycerine of Tannin is used as a **paint** in relaxed throat, and for nasal discharges; also locally as a styptic.

*Does not affect the secretion of the bile.—Dr. Rutherford.*

**Dose.**—2 to 10 grs.

Prescribed in Water, and may be combined with the Protosalts (but not with the Persalts) of Iron. 4 grs. with ½ minim of Glycerine make a nice **pill.** 60 grs. to 1 oz. of Chalk with 30 grains of Powdered Soap makes an astringent dentifrice.

**Incompatibles.**—Mineral Acids, Alkalies, Salts of Antimony, Lead, Silver, and Persalts of Iron, the Vegetable Alkaloids, Gelatine, and Emulsions.

## Preparations.

### GLYCERINUM ACIDI TANNICI.

Tannic Acid, 1; Glycerine, 4. Rub together, and then complete the solution by a gentle heat, not exceeding that of a water-bath.
=(By weight 1 in 6, by measure 1 in 4½).

Sp. g. about 1·3. The colour is always lighter when made without heat.

**Dose.**—10 to 40 minims.

(Dutch, 1 and 5; Port., 1 and 9; U.S., 1 and 4; Belg. and Fr. 1 and 5 of Glycerine of Starch; not in the others.)

### SUPPOSITORIA ACIDI TANNICI.

Tannic Acid, 36 grs.; Oil of Theobroma, 144 grs. Rub the Tannic Acid with 44 grains of the Oil of Theobroma in a slightly-warmed mortar, and add them to the remainder of the Oil of Theobroma, previously melted at a low temperature: mix the whole thoroughly, and pour the mixture while it is fluid into suitable moulds of the capacity of 15 grains.

Each suppository will contain 3 grains of Tannic Acid.

### SUPPOSITORIA ACIDI TANNICI C. SAPONE.

Tannic Acid, 36 grs.; Glycerine of Starch, 30 grs.; Curd Soap, in powder, 100 grs.; mix, and add Starch Powder sufficient (50 grs.) to form a mass, to be divided into 12 conical suppositories.

Each suppository contains 3 grs. of Tannic Acid.

*Note.*—Suppositories containing 10 grs. each are made on these lines as follows:—Tannic Acid, 60 grs.; Glycerine of Starch, 30 grs.; Curd Soap, 60 grs.; Starch, 10 grs.; mix and divide into 6. They keep well.

*They should not be made with Gelatine, but are easily made with Oil of Theobroma.*

### TROCHISCI ACIDI TANNICI.

Lozenges made with Tannic Acid, Sugar, Gum Acacia, and Tincture of Tolu.

Each lozenge contains half a grain of Tannic Acid.

**Dose.**—1 to 6 lozenges.

*T.H.* 1½ grain in each, and made with Black Currant Paste.

(U.S. about 1 grain in each.)

## Not Official.

**SUPPOSITORIUM ACIDI TANNICI C. OPIO.**—Tannic Acid, 3 grs.; Powdered Opium, 1 gr.; Stearine, or Oil of Theobroma, 11 grs.: mix.

**PESSARY OR VAGINAL SUPPOSITORY.**—Tannic Acid, 10 grs.; Stearine sufficient to make 2 drms. For one pessary; used in leucorrhœa.

1 drm. of Tannic Acid with 7 minims of Glycerine, in a conical suppository, placed in the vagina, and plugged in with a sponge, arrests hæmorrhage.

**SCHUSTER'S PASTILLES.**—Tannic Acid, 30 grs.; Opium, 1 gr.; Glycerine, q. s. to form suitable cylinders for the male urethra.

**CRAYONS DE TANNIN** (Fr.).—Tannin, 20; Gum Acacia, 1 (both in powder): mix and make into a mass of pilular consistence by means of equal parts Glycerine and Water, then roll into cylinders of the size required.

**UNGUENTUM ACIDI TANNICI C. OPIO,** (*B.S.H.*).—Tannic Acid, 30 grs.; Powdered Opium, 30 grs.; Lard, 1 oz.

**TANNIC WOOL.**—Dissolve 2 of Tannic Acid in 60 of Water, and with it thoroughly moisten 8 of Absorbent Cotton Wool, press so as to remove 30 of the fluid, then dry the wool in a warm chamber. When dry remove any discoloured portion. This is sold as **Wool for cigarettes**

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## ACIDUM TARTARICUM.

### TARTARIC ACID.

A colourless crystalline Acid, $H_2C_4H_4O_6$, eq. 150, obtained from the Acid Tartrate of Potassium.

**Solubility.**—10 in 8 of Water; 1 in 2½ of Rectified Spirit; 1 in 4½ of Glycerine; 1 in 40 of Ether; 1 in 5 of Absolute Alcohol; nearly insoluble in Benzol and Chloroform.

**Tests.**—100 grains neutralise 133 grains of Bicarbonate of Potassium. 25 grains dissolved in Water require for neutralisation 330 grain-measures of the volumetric Solution of Soda. Its aqueous solution is not affected by Sulphuretted Hydrogen, and gives no precipitate with Solution of Sulphate of Calcium, or Oxalate of Ammonium—indicating absence of metallic contamination, Oxalic Acid, and Lime. It leaves no residue, or only a mere trace, when burnt with free access of air. It is distinguished from all other Acids by forming with strong solutions of Acetate of Potassium a crystalline precipitate (a bitartrate).

Tartaric Acid may also be distinguished from Citric Acid and detected in the latter: (1) By its power of decolorising a weak Solution of Chromate of Potassium, upon which Citric Acid has no action (Alcohol and other reducing agents must be absent); (2) By Pusch's test (*P.J.* xv. 693), with Sulphuric Acid at 212° F., which easily detects 1 per cent. of Tartaric Acid in Citric Acid.

The Resorcin-Sulphuric test (*C.D.* '91, i. 6), is also a delicate test for Tartaric Acid, but in presence of a large proportion of Citric Acid, the red colour is rather obscured, and in that case it offers no advantage over Pusch's test.

25 grains of Tartaric Acid in 1 oz. hot Water dissolves 16 but not 17 grains of Carbonate of Magnesium.—*Proctor.*

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

**Medicinal Properties.**—The same as Citric Acid, for which it was once substituted in saline mixtures.

**Dose.**—10 to 30 grains in Water.

**Incompatibles.**—Salts of Potash, of Lime, of Mercury, and of Lead, Alkaline Carbonates, and the vegetable astringents.

Used in the preparation of Sodii Citro-Tartras Effervescens, and the granular effervescing preparations.

# ACONITI FOLIA.

## ACONITE LEAVES.

The fresh leaves and flowering tops of *Aconitum Napellus*, gathered when about one-third of the flowers are expanded, from plants cultivated in Britain.

The stalks, leaf-stalks, and leaves, when dried, contain about the same percentage of Alkaloid (yield, ·3 per cent.) ; but the flower-buds contain about one-fourth more (yield, ·4 per cent.).

(Belg., Dutch, Fr., Norw., Port., Russ., Span., and Swiss; not in the others.)

**Medicinal Properties.**—Anodyne, antiphlogistic, and antipyretic. Externally it relieves the pain of acute rheumatism and facial neuralgia. It diminishes expectoration in phthisis, and lessens the frequency of the pulse ; it has also been found useful in tetanus.

### Preparation.

**EXTRACTUM ACONITI.**

Take 112 pounds of fresh leaves and flowering tops, bruise them, press out the juice, heat it gradually to 130° F. (54·4° C.), and separate the green matter by a calico filter. Heat the strained liquor to 200° F. (93·3° C.) to coagulate the albumen, and again filter. Evaporate the filtrate by a water bath to the consistence of a thin syrup ; then add to it the green colouring matter previously separated and passed through a hair sieve, and stirring the whole together assiduously, evaporate at a temperature not exceeding 140° F. (60° C.) to a pill consistence.

100 lbs. of plant produce 50 lbs. of juice = 7 lbs. extract, subject to variation.

**Dose.**—$\frac{1}{4}$ to 1 gr.

(Belg., juice from fresh **leaves** evaporated and mixed with an equal quantity of Alcohol, filtered and evaporated ; Norw., alcoholic from **herb** ; Dutch, alcoholic from fresh **herb** ; Fr., also hot aqueous infusion of dried **leaves**, evaporated ; Port., alcoholic from dried **leaves** ; Russ., aqueous from **herb** ; Span., juice from fresh **herb**, clarified and evaporated ; also aqueous from dried **herb** ; and alcoholic from dried **leaves** ; Austr., Fr., Hung., Ital., Swed., Swiss and U.S., alcoholic from **root** ; Swiss and U.S. also **Extractum Aconiti Fluidum**, 1 in 1 from **root**.)

### Not Official.

**SUCCUS ACONITI.**—Aconite Herb Juice, 3 ; Rectified Spirit, 1 : mix, and after seven days filter.

**Dose.**—15 to 20 minims.

# ACONITI RADIX.

## ACONITE ROOT.

The root of *Aconitum Napellus* collected in the winter or early spring before the leaves have appeared, from plants cultivated in Britain and carefully dried; or imported in a dried state from Germany.

The root is annual, and is in perfection in the autumn. It deteriorates during the development of the stem and flowers in the spring and summer; but coincident with this another root forms which arrives at maturity in the following autumn.

The B.P. describes the roots as "usually crowned with the remains of the stem," although it directs the roots to be gathered in winter or early spring, and therefore before the appearance of the stem. The roots should be crowned with the un-opened stem-bud.

In addition to the *A. Napellus,* some quantities of Japanese Aconite roots have from time to time appeared in the market and have been used for the manufacture of the Pharmacopœia preparations.

(Austr., Belg., Fr., Ger., Hung., Ital., Port., Russ., Span., Swed., Swiss and U.S.; not in the others. Austr., Ger., Hung., Swed. and U.S. use the root *only.*)

**Medicinal Properties.**—Same as that of the plant, but possessed in a stronger degree. Internally, it renders the pulse slower but stronger, and reduces inflammation; externally, it relieves rheumatic and neuralgic pain.

## Preparations.

### LINIMENTUM ACONITI.

Aconite Root, in No. 40 powder, 20; Camphor, 1; Rectified Spirit, to percolate, 30; moisten the root with 20 of the Spirit, and macerate in a closed vessel for three days, agitating occasionally; then transfer to a percolator, and when the liquid ceases to pass continue the percolation with more of the Spirit, allowing the fluid to drop into a receiver containing the Camphor until the product measures 30. =(1 in 1½).

It was not the intention of the person who introduced this preparation that the whole of the alkaloids should necessarily be extracted, but rather that a very strong liniment should be made, and this object is somewhat frustrated by the dilution in 1885 of the 1864 and 1867 Liniment.

Applied with a camel's-hair pencil, alone or mixed in equal proportions, with Soap Liniment or Compound Camphor Liniment, and rubbed on the part (but not upon an abraded surface), relieves acute neuralgia.

(U.S. **fluid extract**, 1 in 1; not in the other Pharmacopœias.)

### TINCTURA ACONITI.

Aconite Root from plants cultivated in Britain, in No. 40 powder, 1; Rectified Spirit, to percolate, 8; macerate for forty-eight hours with three-fourths of the Spirit, agitating occasionally; then transfer to a percolator and when the fluid ceases to pass, pour on the remaining one-fourth of Spirit. Afterwards subject the contents of the percolator to pressure, filter the product, mix the liquids, and add sufficient Rectified Spirit to make 8. =(1 in 8).

70 per cent. (by volume) Alcohol is recommended as the best menstruum.—*P.J.* xxi. 1037.

**B.P. Dose.**—5 to 15 minims.

P.G. maximum single dose (·5 gramme), 8½ minims; maximum daily dose (2 grammes), 35 minims.

It is better given in small doses and very frequently, ½ to 1 minim every ten minutes or quarter of an hour for two hours, then hourly.—*Ringer.*

Half a minim in Water given every half-hour reduces abnormal temperature, and leads to free perspiration.

Five minims given every three or four hours, increasing the dose to 20 minims, succeeded in curing a case of neuralgia in the face, when every other remedy tried had failed.

Hydrophobia successfully treated by Tincture of Aconite.—*L.* '82, ii. 215.

**Dr. Fleming's Tincture of Aconite** was made the same strength as the present Liniment, 1 in 1½, but without the Camphor.

(Austr. and Swiss, 1 **Root** in 10 Spirit; Hung., 1 **Root** and 5; Belg., 1 dried **Leaves** and 5; Belg. and Swiss, also 1 fresh **Herb** and 1; Norw., 1 dried **Herb** and 10; Fr., 1 dried **Leaves** and 5; Alcoolature 1 fresh **Leaves** and 1; also 1 fresh **Root** and 1; Ger. and Ital., 1 **Root** and 10; Port., 1 dried **Leaves** and 5; also 1 **Root** and 5; and 1 fresh **Leaves** and 1; Russ., 1 **Root** and 12; Span., 1 fresh **Leaves** and 1; also the same with Spirit of Ether; all by weight. U.S. **Root**, 35; Alcohol to measure 100.)

Symptoms of poisoning by Aconite, violent purging, numbness of limbs.

**Antidotes.**—In case of poisoning by Aconite, the antidotes are emetics, Apomorphine $\frac{1}{10}$ grain, stimulants internal and external; Atropine or Belladonna, Digitalis, Nitrite of Amyl.

Atropine is antagonistic to the action of Aconitine on the heart.—*L.* '81, i. 74.

### Not Official.

**EXTRACTUM ACONITI RADICIS ALCOHOLICUM.**—Austr., Fr., Hung., Ital., Swed., Swiss and U.S.

(Austr., Hung. and Russ., use 70 p. c. Alcohol; Fr. and Ital., 60 p. c. Alcohol; Swed., 65 p. c. Alcohol; Swiss and U.S., 94 p. c. Alcohol.)

**Dose.**—$\frac{1}{6}$ to $\frac{1}{2}$ grain.

Ger. maximum single dose, $\frac{1}{3}$ grain, maximum daily dose, 1½ grains.

**CHLOROFORMUM ACONITI.**—Powdered Root, 20; Chloroform to percolate, 20. Painted on with a camel's-hair brush, relieves neuralgia in almost every form.

**LINIMENTUM ACONITI COMPOSITUM.**—Chloroform of Aconite 1, Liniment of Aconite 7, sprinkled on impermeable piline and applied for neuralgia.

**TROCHISCI ACONITI** (*T.H.*).—Each lozenge contains ½ a minim Tincture of Aconite. Dose, one lozenge every half-hour or hour in tonsilitis and febrile affections of the throat.

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## ACONITINA.

### ACONITINE.

$C_{33}H_{45}NO_{12}$.

Nearly every investigator has assigned to Aconitine a different formula, the Hydrogen figure varying between $H_{43}$ and $H_{47}$. That given above is from the latest researches of Dunstan and Ince.

The B.P. describes Aconitine as an alkaloid obtained from Aconite Root, occurring as a white, usually amorphous, solid, soluble in 150 parts of cold, and 50 of hot Water, and gives a process for its manufacture; but it is universally admitted that a product answering this description should be superseded by a pure crystalline alkaloid as described below.

A comparison, by Schneider (*Y.B.P.* '82, 225), of this process with others, resulted in a yield of ·002 per cent. for the B.P., against ·339 per cent. for the Duquesnel process, the product from the latter being in well-developed crystals, the loss in the B.P. process being no doubt due to the prolonged high temperature employed.

According to the researches of Wright and Luff (1880), *Aconitum napellus* yields (practically) **Aconitine,** an alkaloid split up by Alcoholic Potash into Benzoic Acid and Aconine. *Aconitum ferox* (Nepaul Aconite or Bish) yields (practically) **Pseudaconitine,** split up into Veratric Acid and Pseudaconine, the difference between Aconine and Pseudaconine being very slight, and according to some authorities doubtful. *A. japonicum* yields **Jap-aconitine,** decomposing under the same treatment into Benzoic Acid and Jap-aconine.—*P.J.* xi. 2

The chemical differences between Pseudaconitine and Nap-aconitine are very marked, but the only claim of Jap-aconitine to a separate title lies in the slightly higher combustion figures for Carbon and Hydrogen, and later workers have found these to approximate so closely to Nap-aconitine that they recognise no difference between them.—*P.J.* xx. 1057.

Allen has worked out a process for the estimation of pure Aconitine in a mixture of bases by titration of the Benzoic Acid formed on treatment with an alkali.—*P.J.* xxii. 230.

Dunstan and Carr state, however, that this process is valueless, since Isa-aconitine (Napelline) yields Benzoic Acid by the same process.—*P.J.* xxiii. 626, 752.

It has recently been shown by Dunstan that Nap-aconitine only constitutes one-third to one-fourth of the total alkaloid contained in *A. napellus*, the remainder consisting of: (1) **Isa-aconitine,** isomeric with Aconitine, an uncrystallisable base, forming crystallisable salts; non-toxic in doses comparable with those of Aconitine; (2) **Aconine,** identical with the saponification product of Aconitine, non-crystallisable and also (compared with Aconitine) non-toxic; (3) One or two other amorphous alkaloids.

As crystallised Nap-aconitine is the only constituent which seems to possess, in a highly intensified degree, the properties ascribed to the Aconite plant, it is expected that now the name **Aconitine** will be applied to this compound only and in a condition of approximate purity.

The principal characters ascribed by Dunstan to the pure alkaloid are: (1) A crystalline base forming crystalline Salts; (2) Melting-point 188-189° C.; (3) Solubility at 22° C.—in Water 1 in 4,400, in Alcohol 1 in 37; (4) Alcoholic solution of base, dextro-rotary; Aqueous Solution of Salts, lævo-rotary; (5) Melting-point of Hydrobromide 163° C., and of Auro-chloride 135·5°; (6) Produces characteristic tingling sensation on tongue, but no bitterness.

From *P.J.* xxiii. 766, it would be inferred that the crystallised Aconitine obtained by Dunstan and Carr was so pure as to be more toxic than any other Aconitine previously used therapeutically, and from *P.J.* xxiii. 626, it might also be inferred that approximately pure Aconitine was of comparatively recent as well as rare occurrence in commerce. This is scarcely correct, as the Aconitine Cryst. described in "Companion," 1890, was indistinguishable in its physiological action from that prepared by Dunstan and Carr, and has been obtainable since 1886.

**Tests.—Commercial Aconitine Cryst.** (as stated in our previous edition, 1890), should be distinctly crystalline; should dissolve without colour in concentrated Sulphuric Acid, and if a drop of Simple Syrup be added to this solution, no red colour should be produced even after standing some hours—absence of Aconine; should have a melting-point not lower than 176·6° C. (350° F.), should not dissolve in less than 1 in 2,500 of cold Water.

The *best* commercial samples do not melt below 186° C. (367° F.); dissolve about 1 in 35 of Rectified Spirit, 1 in 45 of Ether, 1 in 1 of Chloroform.

Aconitine Amorphous usually melts about 71° C. (160° F.).

Pseudaconitine (English) melts at 105·5° C. (222° F.) and foreign 76·5° C. (170° F.).

**Pseudaconitine** can be distinguished from Aconitine by the beautiful purple red colour produced on adding a solution of Caustic Potash in absolute Alcohol to the yellow residue obtained by evaporating a small quantity of the alkaloid with a few drops of fuming Nitric Acid. It can also be recognised by other tests dependent upon the formation of Veratric Acid derivatives—which Aconitine does not yield.

(Fr., Duquesnel process; Span., similar; both are crystalline products; Belg., similar to Brit.; Hung. specifies "German Aconitine"; Port., indefinite, must obviously contain Aconines.)

**Medicinal Properties.**—It relieves acute nervous pain when rubbed on the part in the form of ointment, producing a tingling sensation, followed by numbness. Care must be taken that it does not come in contact with a mucous surface or abraded skin.

It has been given with marked benefit in trigeminal neuralgia, and to relieve the pain of *acute* rheumatism and gout.

With the exception of the well-known brand "English Aconitine," which possesses all the characters of Pseudaconitine from *A. ferox*, no Aconitine should be used medicinally which does not conform to the tests given above. As, however, the doses which have been given of "German Amorphous" Aconitine are about ten times that of the crystallised alkaloid, great care must be taken in prescribing and dispensing to define the variety intended.

**Dose.**—As a pure crystalline Aconitine would probably be fatal to an adult in a dose of 3 milligrammes ($\frac{1}{22}$ grain), the maximum dose should not exceed $\frac{1}{10}$ milligramme pro dosi, or $\frac{5}{10}$ milligramme per diem, and the commencing dose should be smaller.

Solutions of the alkaloid are prone to decomposition; aqueous or alcoholic solutions should therefore be slightly acidified with **Hydrochloric Acid**, or crystallised **Nitrate of Aconitine** should be used.—*P.J.* xvi. 802.

## Preparation.

### UNGUENTUM ACONITINÆ.

Aconitine, 8 grs.; Rectified Spirit, ½ drm.; dissolve and add Benzoated Lard, 1 oz.; mix. =(about 1 in 60).

There may be some uncertainty as to what quality of alkaloid should be used in making this Ointment, for although the B.P. characters given for Aconitine have been the same for the last 30 years, it has long been known that they refer to a very impure product. We assume that, in first-class dispensing, the article in use up to a comparatively recent date would be the English make, now known to be Pseudaconitine, the potency of which does not appear to differ much from that of Nap-aconitine.

From our experience of an Ointment so made, we know that it is efficient and we have never heard of any injurious effects following its use; we may therefore assume that in future Aconitine Cryst. will also be used in making the Official Ointment, Chloroform, instead of Rectified Spirit, being used as the solvent.

(Span., Pomada de Aconitina—Aconitine 1, Olive Oil 2, Lard 40; not in the other Pharmacopœias.)

## Not Official.

**OLEATUM ACONITINÆ.**—Aconitine, 2 grs.; Oleic Acid, 98 grs.: dissolve.

Dr. Shoemaker states that this has a slight local action, and it can be used in mild cases of neuralgia.—*B.M.J.* '84, ii. 750.

## ACTÆA RACEMOSA.

*See* CIMICIFUGÆ RHIZOMA.

## ADEPS LANÆ.

WOOL FAT.

The purified Cholesterin-fat of Sheep's Wool.

The type of this is the commercial "Anhydrous Lanoline."

A yellowish tenacious unctuous substance; almost inodorous; with a melting point varying from 100° F. (37·8° C.) to 112° F. (44·4° C.); readily soluble in Ether and Chloroform, sparingly soluble in Rectified Spirit. Ten grains should dissolve almost completely in 14 fluid drachms of boiling Ethylic Alcohol, the greater part separating in flocks on cooling. Ignited with free access of air, it burns, leaving but a trace of ash. 50 grains dissolved in 4 fluid drachms of Ether, and 2 drops of tincture of Phenol-phthalein added, should not require more than 2 grain-measures of Volumetric Solution of Soda to produce a permanent red colouration. The Solution in Chloroform poured gently over the surface of Sulphuric Acid acquires a purple red colour. Heated with Solution of Soda, no Ammoniacal odour should be evolved.

The Official melting-point has been altered. In the first issue of the Addendum it was given as 104°-111° F. (40°-43·9° C.) As noted in our "Supplement, 1891," the melting-point of the best samples will approximate to 104° F.

According to Helbing, the limit of acidity might well be reduced to one-tenth the quantity allowed in B.P., and a saponification test added.

The latter is effected by heating 5 grms. of the sample in a strong stoppered bottle to 100° C. for two hours with 20 c.c. of 10 per cent. Alcoholic Potash; diluting to a litre, and titrating the uncombined alkali with standard Acid and Phenol-phthalein.

A thoroughly purified Wool Fat will combine with about 8½ per cent. of KHO; Glycerine Fats give much higher figures (Lard 20 per cent.; Olive Oil 18 per cent.; Cocoa Nut Fat 26 per cent.), while Petroleum bases being unsaponifiable do not consume any.

### Preparation.

**ADEPS LANÆ HYDROSUS.** HYDROUS WOOL FAT.*

Wool Fat, 7; Distilled Water, 3; melt the Wool Fat in a warm mortar, stirring in the Water gradually and thoroughly.

Yellowish white; free from rancid odour. When heated, it separates into an upper oily and lower aqueous layer. 100 grains exposed over a Water-bath until the weight is constant, yields not less than 70 grains, which should answer to the tests for Wool Fat.

The B.P. directions make no mention of *stirring*, and without this the drying process is incomplete after 10 hours' exposure on a Water-bath.

By heating to 130° C. with constant stirring, dehydration is complete within 20 minutes.

An approximate estimation may be made by dissolving 10 grms. of the sample in 10 c. c. of Chloroform and measuring the separated Water in a graduate.

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* Hydrous Wool Fat is commonly known as "Lanoline," which is a registered trade mark in the United Kingdom.

The maximum proportion of Water which can be incorporated with Anhydrous Wool Fat is 1¼ times its weight.

(Austr., Dan., Lanolinum; Ital., Lanolina; Russ. and Swiss, Adeps Lanæ; U.S., Adeps Lanæ Hydrosus; not in the others.)

**Medicinal Properties.**—Used as a basis for ointments. It does not become rancid. Mixes with about half its weight of water It is better for ointments when mixed with an equal weight of Soft Paraffin.

Contained in Ung. Conii.

## ADEPS PRÆPARATUS.

### PREPARED LARD.

*N.O.Syn.*—Axungia, *Edin.*

The purified fat of the Hog, Sus scrofa.

Take of the internal fat of the abdomen of the hog, perfectly fresh, 14 pounds. Remove as much of the external membranes as possible, and suspend the fat so that it shall be freely exposed to the air for some hours; then cut it into small pieces, and beat these in a stone mortar until they are thus, or by some equivalent process, reduced to a uniform mass, in which the membranous vesicles are completely broken. Put the mass thus produced into a vessel surrounded by warm water, and apply a temperature not exceeding 130° F. (54·4° C.), until the fat has melted and separated from the membranous matter. Finally strain the melted fat through fine flannel.

Lard is not adulterated as a rule, but it was frequently prepared in the country with little care, and consequently bad in colour and odour; now, however, it is made upon a very large scale by London manufacturers, of superior quality.

It is apt to grow rancid by keeping, and mouldy if it contains water.

Rancidity is the result of oxidation, which takes place rapidly in strong daylight, and but slowly or not at all in the dark.

It is the basis of several ointments.

**Melting Point** is given in B.P. at about 100° F. (37·8° C.); we found that a sample began to melt at 95° F. (35° C.), but was not clear below 117° F. (47·2° C). Dieterich gave it as 36° to 38° C. (*C.D.* '87, i. 770); and 43° to 44° C. (*C.D.* '89, i. 575).

**Solubility.**—1 in 22 of Ether and 1 in 16 of Oil of Turpentine.

**Tests.**—Has no rancid odour; dissolves entirely in Ether. Distilled Water in which it has been boiled when cooled and filtered gives no precipitate with Nitrate of Silver, and is not rendered blue by the addition of solution of Iodine—indicating absence of Salt and Starch.

If free from Water it will dissolve bright in Chloroform and with a very slight turbidity in Bisulphide of Carbon.

(Austr., Belg., Dan., Dutch, Fr. (Axonge), Ger., Hung., Ital. (Grasso Suino), Norw., Port. (Banha), Russ., Span. (Grasa de Cerdo), Swed., Swiss and U.S.)

**Medicinal Properties.**—Emollient. Added to poultices to prevent them drying and sticking to the skin. Used also in scabies, and to destroy pediculi.

Used in the preparation of Emplastrum Cantharidis, and the following Ointments:—Iodine, Mercury, Nitrate of Mercury, and Turpentine.

Several substitutes for lard have been proposed, and among them certain products obtained from petroleum ; and more recently a fat obtained from sheeps' wool, and sold under the name of "Lanoline," which has great penetrating powers.

*See* ADEPS LANÆ, PARAFFINUM DURUM, and PARAFFINUM MOLLE.

### Preparation.

### ADEPS BENZOATUS.

Prepared Lard, 16 oz. ; Benzoin, in coarse powder, 140 grs. ; heat together in a Water-bath for two hours, stirring frequently, and finally remove the residual benzoin by straining.

Balsam of Tolu and Storax have also been recommended. The new Ph. Ger. orders 1 per cent. of Benzoic Acid.

The proportion of Siam Benzoin soluble in Lard is exceedingly variable ; we have seen samples yielding as low as 20 per cent. and as high as 88 per cent. of residue.

(Brit., Dan., Ital. (Grasso con Benzoino), Norw., Russ., Swed., Swiss and U.S., Benzoin 2, Lard 100 ; Span., 3 and 100 ; Austr. and Belg., 4 and 100 ; Fr., 5 Tincture in 1000 ; Ger., 1 Acid. Benz. in 100 ; not in the others.)

Benzoated Lard is irritating and should not be used for **eye ointments.**

Used for making the following ointments:—Aconitine, Atropine, Belladonna, Calamine, Chrysarobin, Galls, Calomel, Iodoform, Acetate of Lead, Iodide of Potassium, Savin, Simple, Stavesacre, Sulphur, and Zinc.

### Not Official.

**UNNA'S SALVE MULLS.**—The bases of these are hog's lard and beef suet (singly or combined), with which are incorporated various medicaments, and spread on muslin. —*L.M.R.* '81, 452.

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### Not Official.

## ADONIS.

The leaves and stalks of *Adonis vernalis.*

(Ital. ; not in the other Pharmacopœias.)

**Medicinal Properties.**—A cardiac tonic.

Useful in mitral and aortic regurgitation.—*L.* '88, ii. 1012.

**Dose.**—2 to 6 grains in **powder**, or as an **infusion** or **tincture.**

**ADONIDIN.**—A glucoside, soluble in Water and Alcohol.

**Dose.**—$\frac{1}{10}$ to $\frac{1}{3}$ grain per diem.

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## ÆTHER.

### ETHER.

*B.P.Syn.*—Sulphuric Ether.

A colourless, very volatile and inflammable liquid, prepared from Alcohol and containing not less than 92 per cent. by volume of pure Ether $(C_2H_5)_2O$, eq. 74.

**Solubility.**—1 in 10 of Water; mixes in all proportions with Rectified Spirit.

Water dissolves a tenth of its volume of Ether, and reciprocally Ether takes up about the same proportion of Water. It evaporates speedily in the open air, with the production of considerable cold. When good, it evaporates from the hand without leaving a disagreeable odour. It boils below 105° F. (40·5° C.), and its vapour is very heavy and very inflammable. It dissolves Corrosive Sublimate, Red Iodide of Mercury, Iodine and Bromine freely; Sulphur and Phosphorus sparingly. It is also a solvent of the volatile and fixed oils, many resins and balsams, caoutchouc, and most of the organic vegetable alkaloids.

It does not dissolve Potash and Soda, in which respect it differs from Alcohol.

**Tests.**—Sp. g. (at 92 p. c.) ·735. 50 measures agitated with an equal volume of Distilled Water are reduced to 45 by an absorption of 10 per cent. It evaporates without residue.

(Austr., Norw., and Swed., sp. g. ·725; Belg., Dan., Fr., Ger. and Russ. sp. g. ·720; Dutch, sp. g. ·722—·725; Fr., also sp. g. ·724; Hung. sp. g. ·724—·728; Ital. (Etere), sp. g. ·720—·722; Port., sp. g. ·728; Span. (Eter), sp. g. ·758; Swiss, sp. g. ·720—·722; U.S., sp. g. ·725—·728.)

**Medicinal Properties.**—It is a powerful, diffusible stimulant, antispasmodic, and narcotic, and is of great use in dyspnœa and gastralgia. Used to expel flatus from the stomach, and to allay pain and cramp in that organ. In nausea it is given as a cordial. It excites secretion from the mucous surfaces of the alimentary tract, and, as it stimulates the pancreas, it is sometimes given with Cod Liver Oil.

**Dose.**—20 to 60 minims.

Best prescribed as Spirit of Ether, which mixes readily with water.

When used **hypodermically** for heart failure the dose is 15 to 30 minims.

Used in the preparation of Collodium, Collodium Flexile, Extractum Filicis Liquidum, Extractum Mezerei Æthereum, Extractum Stramonii, and Tinctura Chloroformi et Morphinæ.

### Preparations.

**ÆTHER PURUS.** PURE ETHER. *B.P.Syn.*—OXIDE OF ETHYL.

Ether $(C_2H_5)_2O$, free from Alcohol and Water.

Shake 40 of Ether with 20 of Water in a bottle, and after a few minutes decant the Ether, mix it with 20 of fresh Water, shake, and again decant; put the decanted Ether into a retort, with 1 of recently burnt Lime, and 4 of dried Chloride of Calcium; attach closely a receiver, and let them stand twenty-four hours, then distil.

Boils at 95° F. (35° C.); the density of the vapour is about 2½ times that of atmospheric air.

**Tests.**—Sp. g. not exceeding ·720. When shaken with a fourth of its bulk of Solution of Iodide of Potassium and a little Starch paste, little or no blue colour is produced.

This test is misleading, for few commercial samples (*and those not the purest*) will pass the test. Hydrogen Peroxide is best detected by the Chromic Acid test.—*P.J.* xvii. 842, 849.

If free from Water it will dissolve in an equal volume of Bisulphide of Carbon; when free from Alcohol it mixes without turbidity with twice its volume of Oil of Copaiba.—*Allen.*

(Span., sp. g. ·720; Hung., sp. g. ·724—·728: *see* also under Æther.)

**Medicinal Properties.**—Ether was first used as an anæsthetic for capital operations in 1846, and Pure Ether is still preferred by some to Chloroform, as it has a much less depressing effect upon the heart, and may be used for prolonged operations. It is used also in conjunction with Nitrous Oxide for minor operations in dentistry.

It has been used as a **spray** for obtaining local anæsthesia from the cold produced by rapid evaporation of the Ether. The lower the boiling point of the Ether the more complete is the anæsthesia; therefore Methylated Ether, sp. g. ·717, is preferable.

Used in the preparation of Tinctura Strophanthi.

**SPIRITUS ÆTHERIS.** The HOFFMANN'S ANODYNE of the Continental Pharmacopœias.

Ether, 1; Rectified Spirit, 2. =(1 in 3).

Sp. g. ·809.

**Dose.**—30 to 90 minims.

(Austr., Dan., Ger., Hung., Norw., Swed. and Swiss, 1 and 3; Belg., Æther Sulphuricus Alcoholicus, 468 in 1000, sp. g. ·791—·795; Dutch, Æther cum Spiritu, 1 and 1, sp. g. ·775—·782; Fr. Éther Officinal Alcoolisé, 1 and 1, sp. g. ·783; Ital., Etere con Alcool, 1 and 1; Port., Ether Alcoolisado, 7 and 3; Russ., 1 and 2, sp. g. ·800; Span., Eter Sulfurico Alcoholizado, 4 and 1; U.S., 3¼ in 10. All by weight except U.S.)

Used in the preparation of Tinctura Lobeliæ Ætherea.

**SPIRITUS ÆTHERIS COMPOSITUS.** *B.P. Syn.*—HOFFMANN'S ANODYNE.

Gradually mix 36 oz. Sulphuric Acid with 40 oz. Rectified Spirit, and let the mixture stand twenty-four hours; then distil until the fluid in the retort begins to blacken. Shake the distillate with Lime Water to neutralise any acid, and remove the supernatant liquor, and expose it to the air for about twelve hours. Pour 3 drs. of the resulting liquid into a mixture of 8 oz. Ether and 16 oz. Rectified Spirit.

This process consists principally in the preparation of Ether, and the evaporating the same into space. The amount of evaporation during the specified twelve hours may result in a residue measuring from 160 minims to 7 fl. oz., according to the conditions of exposure.—*P.J.* xvii. 315.

Professor Power (*P.J.* xxii. 614) has recently declared that this same preparation should be banished from the U.S.P., as "alike discreditable to American Pharmacy and Medical Practice."

**Dose.**—30 to 120 minims.

(U.S., Ether, 325; Alcohol, 650; Ethereal Oil, 25. Not in the others.)

### Not Official.

**ÆTHER METHYLATUS.**—Sp. g. ·717. Prepared from Methylated Spirit. It can be purified to such an extent by washing and redistillation as to be scarcely distinguishable from that made from Pure Spirit. The Methylic Ether being so extremely volatile is almost wholly lost during the purification.

An Ether, sp. g. ·715, can be obtained in limited quantity by careful working; occasionally samples are drawn over at ·713, in cold weather.

**Medicinal Properties.**—It is largely employed as a **spray** for local anæsthesia, as well as for **inhalation.** As in the case of "Methylated Chloroform," the impurities from the Wood Spirit employed in the manufacture can be so completely eliminated as to allow of its substitution in many cases.

Methylated Ether, sp. g. ·720, is *not* so suitable as the above, for the **spray** because it volatilises less rapidly, and for **inhalation** because it is not sufficiently purified.

Methylated Ether can be made more volatile for use with the **spray** by the addition of 20 per cent. of a light Petroleum Ether.

**SPIRITUS ÆTHERIS MURIATICUS.**

*Syn.*—Sp. Salis Dulcis; Clutton's Febrifuge Spirit.

A colourless liquid. Sp. g. ·860.

A very old preparation, and is still prescribed for feverish symptoms.

**Dose.**—30 to 60 minims.

(Dan. and Norw., Æther Chloratus Spirituosus, and Swiss, Spiritus Ætheris Chlorati, sp. g. ·838—·842.)

## ÆTHER ACETICUS.

ACETIC ETHER.

*B.P.Syn.*—Acetate of Ethyl.

$C_2H_5C_2H_3O_2$, eq. 88.

A colourless liquid, with an agreeable ethereal odour, prepared by distilling dried Sodium Acetate with a mixture of Sulphuric Acid and Alcohol with subsequent dehydration over dried Carbonate of Potassium.

It is generally agreed that fused Acetate of Sodium should be used for the distillation and also for the dehydration of Acetic Ether.

**Solubility.**—About 1 in 9 of Water. Soluble in all proportions in Rectified Spirit and in Ether.

A good commercial specimen should contain over 90 per cent. of Acetic Ether.

**Tests.**—Sp. g. about ·900. Boiling point about 166° F. (74·4° C.).

It would be an improvement if, instead of boiling point 166° F., B.P. stated "not less than 90 per cent. should distil between 155° and 160° F., the bulb of the thermometer being placed as usual in the neck of the fractionating flask."

10 c. c. of Pure Acetic Ether shaken with 10 c. c. of saturated solution of Chloride of Calcium will lose ·2 c. c.; each additional loss of ·1 c. c. indicates 1 per cent. of impurity."—*P.J.* xiii. 781.

In six samples examined we found 6·0, 6·5, 11·5, 15·0, 60·0 and 63·0 per cent. of impurity.

When 10 c. c. are agitated with an equal volume of Water in a graduated test-tube, the upper, ethereal layer, after its separation should measure not less than 7 c. c.—*Squibb*, '84, 512.

U.S. and Ger. allow only a loss of 10 per cent. by this test.

(Austr., Hung. and Russ., sp. g. ·900; Belg., sp. g. ·890; Dan., Dutch, Ger., Norw. and Swed., sp. g. ·900—·904; Fr. sp. g. ·915; Ital. (Etere Acetico), sp. g. 906; Port., sp. g. ·920; Span., sp. g. ·916; Swiss, sp. g. ·904; U.S., sp. g. ·893—·895.)

**Medicinal Properties.**—Antispasmodic and carminative. It is also used as a sedative **inhalation** in irritation of the larynx, 30 minims in a pint of Water.

**Dose.**—20 to 60 mins.

Used in the preparation of Liquor Epispasticus.

## ÆTHERIS NITROSI SPIRITUS.

*See* SPIRITUS ÆTHERIS NITROSI.

Not Official.

## ÆTHYL BROMIDUM.

BROMIDE OF ETHYL. HYDROBROMIC ETHER.

$C_2H_5Br$.

A volatile, colourless liquid, which is not readily inflammable. It is best prepared by acting upon Bromide of Potassium with Sulphuric Acid in the presence of Alcohol, as described in the French Codex.

Sp. g. is given in French Codex 1·47, and in German Ph. 1·45. The former figure is probably the correct one, a very pure sample sold as containing 1 p.c. of Alcohol had sp. g. 1·461, but ordinary samples may run as low as 1·34.

Boiling point of a sample sp. g. 1·45 was 38·5° C. (101° F.), and dissolved in 120 parts of Water.

Its liability to decomposition may be prevented by the addition of Alcohol, and by exclusion of light and air.

**Solubility.**—1 in 120 of Water, but will vary with sp. g. of sample; it mixes in all proportions with Rectified Spirit and Ether.

It should give no reaction with pure Sulphuric Acid, or no more than a yellow colour after an hour. When evaporated should leave no residue. Its vapour should have a pleasant ethereal odour.

(Fr., Éther Brômhydrique; Ger. and Swiss, Æther Bromatus; Russ., Æthylum Bromatum; not in the other Pharmacopœias.)

**Medicinal Properties.**—It is a local and general anæsthetic, more rapid in its action than Chloroform, and occasionally used in conjunction with it. It is useful in minor surgery, also in obstetric practice and in dental operations.

It should be administered in the same manner as Ether, and is very prompt in its action. It should not be given in prolonged operations or in renal disease. Has been used as a **spray** to produce local anæsthesia.—*References*—*L.M.R.* '80, 213; '87, 327: *T.G.* '85, 383; '86, 833; '87, 860; '91, 123; '92, 365, 399; *L.* '90, ii. 414; '92, ii. 103.

Strongly recommended in dental operations.—*L.* '89, i. 848.

A **solution,** 1 in 200 of Water, in angina pectoris, dose ½ to 2 oz., *M.A.* '87, 24.

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Not Official.

## ÆTHYL IODIDUM.

IODIDE OF ETHYL. HYDRIODIC ETHER.

$C_2H_5I$.

A colourless, volatile, heavy, and non-inflammable liquid, prepared by acting upon Alcohol with Iodine and Amorphous Phosphorus.

Has an agreeable ethereal odour and pungent taste.

Sp. g. 1·943. Boils at 79° C. (175° F.).

It soon acquires a reddish brown colour on exposure to light; but if no deeper than a pale wine colour it may be disregarded.—*Squibb.*

The change of colour can be prevented by putting in the bottle a globule of Mercury, also by adding to each ounce vial, 5 c.c. $\frac{1}{5}$n. solution of Soda, which will absorb any free Iodine which may be formed.

**Solubility.**—1 in 440 of Water; mixes in all proportions with Rectified Spirit.

(Fr., Éther Iodhydrique; not in the other Pharmacopœias.)

**Medicinal Properties.**—The Iodine is very rapidly absorbed from this substance. It is used as an **inhalation**; 15 to 20 drops inhaled through the nose from a wide-mouthed bottle is more accurate and economical than dropping it on a handkerchief. It is said not to weaken the digestive organs but rather to have a tonic effect. It has been inhaled with success in chronic bronchitis and asthma, and for the relief of dyspnœa; also in secondary and tertiary syphilis as an adjunct to the administration of Iodide of Potassium.—*Squibb*, '88; *B.M.J.* '89, ii. 1216; *P.J.* xix. 46.

It is also used as a vesicant and as an application to the uterus.—*L.* '85, ii. 755.

Not Official.

## ÆTHYL NITRIS.

*See* SPIRITUS ÆTHERIS NITROSI.

Not Official.

## AGARICUS ALBUS.

AGARIC OF THE LARCH. WHITE OR PURGING AGARIC.

A species of mushroom found growing on the larch. As found in commerce, it is deprived of its outer coat, and is a light white spongy mass, easily rubbed to a powder on a sieve.

(Belg., Fr., Ital. (Agarico Bianco), Port. (Agarico Brancho), Russ., Span. and Swiss; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been used with success in night sweating of phthisis, checking cough and promoting sleep; also in hæmoptysis. It has a strong cathartic action.—*Pr.* xxix. 321; *M.T.* '81, ii. 442; *T.G.* '88, 41 and 371.

**Dose.**—5 to 30 grains of the powder, given in jam.

**AGARICIN** (Agaricic Acid). The active principle. A white crystalline powder. Melts at 138° C. (280·4° F.). Generally given with Dover's powder in a pill.

(Dan., Ger. and Russ.; not in the other Pharmacopœias.)

**Solubility.**—1 in 140 of Rectified Spirit; practically insoluble in Water and in weak Alcohol.

**Dose.**—$\frac{1}{4}$ to 1 grain.

It should not be given hypodermically.—*L.M.R.* '84, 118.

## ALBUMEN OVI.

*See* OVI ALBUMEN.

## ALCOHOL AMYLICUM.

AMYLIC ALCOHOL.

*B.P.Syn.*—Fousel Oil; Hydrate of Amyl.

Amylic Alcohol, $C_5H_{11}HO$, with a small proportion of other spirituous substances. It should be redistilled, and the product passing over at 262° to 270° F. (128°—132° C.) be alone collected for use.

The first issue of the B.P., 1885, gave these figures as 253° to 260° F. (122·8° to 126·7° C.).

A colourless liquid with a characteristic odour, obtained as a by-product in the distillation of crude Spirit.

When pure its sp. g. is ·818. Exposed to the air in contact with Platinum-black, it is slowly oxidised, yielding Valerianic Acid.

**Solubility.**—1 in 40 of Water; in all proportions in Alcohol, Ether, and Essential Oils.

(Belg. sp. g. ·818, boils at 132° C.; Ital. sp. g. ·808, boils at 130°—131° C.)

Used in the preparation of Amyl Nitris and Sodii Valerianas; also as a solvent in proximate organic analysis.

## ALCOHOL ETHYLICUM.

ETHYLIC ALCOHOL.

*B.P.Syn.*—ABSOLUTE ALCOHOL.

$C_2H_5HO$.

A colourless liquid, prepared by dehydrating Rectified Spirit with Anhydrous Carbonate of Potassium, and distilling it over fused Chloride of Calcium. It may contain one, or at most two per cent. of Water.

**Tests.**—Sp. g. ·797—·800. Entirely volatilised by heat; not rendered turbid when mixed with Water (absence of Fousel Oil); does not cause anhydrous Sulphate of Copper to assume a decided blue colour, even after the two have been well shaken together (absence of Water).

Sp. g. of Absolute Alcohol (100 per cent.) is ·794.

To apply the Sulphate of Copper test, add 8 grains of the Anhydrous Sulphate to 2 drachms of the Alcohol in a ½ oz. stoppered bottle, and shake occasionally during 7 minutes. If below the B.P. standard the white powder will be coloured distinctly bluish-green. For other tests, see our note, *C.D.* '93, ii. 118.

When added to five times its volume of Bisulphide of Carbon, it will remain clear till cooled below 45° F.

(Belg., Ital. and Span., sp. g. ·794; Dan., sp. g. ·831—·834; Fr., sp. g. ·816; Swiss, sp. g. not higher than ·800; U.S., sp. g. not higher than ·797; not in the others.)

Used in the preparation of Chloroform and Liquor Sodii Ethylatis.

### Not Official.

## ALCOHOL METHYLICUM.

*Syn.*—RECTIFIED PYROXYLIC SPIRIT.

A product of the destructive distillation of wood, which has been submitted to various processes of rectification.

A colourless liquid with a peculiar odour.

Sp. g. about ·803.

It is without action on Litmus; is not rendered turbid by admixture with water; free from smoky taste.

It mixes readily with Water, Ethylic Alcohol, Chloroform, and Ether.

It dissolves Fats and Volatile Oils.

**Wood Spirit, Wood Naphtha, Pyroxylic Spirit** are names applied to the crude article of commerce, which may contain from 75 to 90 per cent. of real Methylic Alcohol.

**Medicinal Properties.**—Narcotic, sedative, and anti-emetic. It palliates the cough and lessens the febrile excitement of phthisis. It has been mixed with chloroform for use as an anæsthetic (Regnauld's Anæsthetic Mixture). *See* CHLOROFORM.

**METHYLATED SPIRIT.**—*See* SPIRITUS VINI RECTIFICATUS.

**METHYLIC ETHER.**—It is gaseous at ordinary temperatures, but is condensed by cold and pressure to a liquid boiling at —20° C. (—4° F.). A solution of this in Ethylic Ether is useful for producing local anæsthesia.

## ALOE BARBADENSIS.

### BARBADOES ALOES.

The juice, when inspissated, which flows from the transversely-cut bases of the leaves of *Aloe vulgaris ;* imported from Barbadoes and the Dutch West Indian Islands, and known in commerce as Barbadoes and Curaçoa Aloes.

Although Aloe Vulgaris (Lam.), also known as Aloe Vera (Linn.), A. Vulg. (Bantin), and A. Barbad. (Miller), has been credited as the source of all West Indian Aloes, the species grown in Curaçao is really A. Chinensis, and as of late years very little real Barbadoes Aloes has come to market, its place and name being taken by a pale Curaçao variety, the B.P. derivation will probably require modification.

**Solubility.**—Water dissolves 75 per cent. Almost entirely soluble in proof Spirit.

**Tests:—**

1. **Borntrager's test.**—Shake out with Benzene, and treat separated Benzene with Ammonia ; pink colour on standing. Superseded by No. 5.

2. **Klunge's test.**—Warm with Copper Sulphate and a little Chloride of Sodium ; yellow colour, changing to red or violet. Fair test for West Indian Aloes, but not much good for the other varieties.

3. **Fluckiger's test.**—Sulphuric Acid and Nitric Acid Vapour ; deep blue colour. Specific test for Natal Aloes.

4. **Bainbridge's test.**—Nitric Acid ; red colour, changing to green. Distinctive of Cape Aloes.

5. **Cripp's and Dymond's test.**—Triturate 1 grain of sample with 16 drops Sulphuric Acid, add 4 drops Nitric Acid and dilute with an ounce of Water. A deep orange to crimson colour is developed, intensified by the addition of Ammonia. This appears to be the best general test for Aloes.—*P.J.* xv. 633. The reaction is also given by all bodies containing or yielding Chrysophanic Acid, but these yield a pink colour with Ammonia alone, while Aloes only gives a pale yellow.

(Belg., Fr., Port. and U.S. ; not in the others.)

**Medicinal Properties.**—Purgative, acting chiefly on the large intestine. Employed as an enema in dislodging ascarides from the rectum, also as a stimulating cathartic in the constipation of amenorrhœa.

It is found by experiment that the aqueous extract is far more active than is the resinous portion of Aloes ; the Barbadoes Aloes containing a larger amount of this than the Socotrine, is perhaps the reason why the Barbadoes is the more purgative ; thus, 2 grains are equal to 3 grains of Socotrine.

**Dose.**—2 to 6 grs.

Used in the preparation of Aloin, Pil. Cambogiæ Comp., Pil. Colocynthidis Comp., and Pil. Colocynthidis et Hyoscyami.

## Preparations.

### ENEMA ALOES.

Aloes, 40 grs.; Carbonate of Potassium, 15 grs.; Mucilage of Starch, 10 oz.; mix for one enema.

10 grains are generally found to be sufficiently strong.

Note.—Enema Aloes can be made with either Aloe Barbadensis or Aloe Socotrina.

### EXTRACTUM ALOES BARBADENSIS.

Barbadoes Aloes, 16 oz. in small fragments, thoroughly mixed with 1 gallon (=160 oz.) of boiling Distilled Water, allowed to stand for twelve hours, then pour off the clear liquid, strain the remainder and evaporate the mixed liquors by a current of warm air to dryness.

**Dose.**—1 to 3 grs. British Ph. 2 to 6 grs.

(100 parts of Aloes yield 75 parts of extract.)

### PILULA ALOES BARBADENSIS.

Barbadoes Aloes, in powder, 2; Hard Soap, in powder, 1; Oil of Caraway, $\frac{1}{8}$; Confection of Roses, 1. Mix. =(1 in 2).

**Dose.**—5 to 10 grs.

### PILULA ALOES ET FERRI.

Barbadoes Aloes, in powder, 2; Sulphate of Iron, $1\frac{1}{2}$; Compound Powder of Cinnamon, 3; Confection of Roses, 4. Mix. (6 of Confection are required.) =(about 1 in 6).

The Sulphate of Iron is said to heighten the action of Aloes.

**Dose.**—5 to 10 grs.

(U.S., Purified Socotrine Aloes, 1; Dried Sulphate of Iron, 1; Aromatic Powder, 1; Confection of Roses, q.s.: Ger., Cape Aloes, 1; Dried Sulphate of Iron, 1; Alcohol, q.s.; Swiss, Aloes, 5; Sulphate of Iron, 5; Soap, 1; Glycerine, q.s.; not in the others.)

## Not Official.

**PILULA ALOES DILUTA.**—Marshall Hall's Pill. Take of Barbadoes Aloes 4 oz., dissolve in water and strain, then add 4 oz. Extract of Liquorice, 4 oz. Treacle, 4 oz Hard Soap thinly sliced; mix and evaporate to a pill consistence.

**Dose.**—3 or 4 grains.

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Not Official.

## ALOE CAPENSIS.

CAPE ALOES.

A translucent variety, now the only one officially recognised in the German Pharmacopœia (A. Ferox and A. Africana).

(Official in all the Continental Pharmacopœias.)

**Test.**—It is distinguished from all others by giving with Nitric Acid a red colouration changing to a permanent green.

This variety was attributed mainly to A. Ferox, but the above colour reaction points rather to A. Africana and A. Platylepsis as the source of the drug.

**NATAL ALOES.**—Another hepatic variety apparently derived from A. Succotrina and characterised by giving a deep blue colour with Sulphuric Acid followed by Nitric Acid Vapour (Fluckiger's test).

## ALOE SOCOTRINA.

### SOCOTRINE ALOES.

The juice, when inspissated, which flows from the transversely-cut bases of the leaves of *Aloe Perryi*, and probably other species.

Imported principally by way of Bombay and Zanzibar, and known in commerce as Socotrine and Zanzibar Aloes.

The real old Socotrine Aloes from *A. Perryi*, grown in Socotra, now seems to exist only as museum specimens. The commercial article agrees in its reaction with Barbadoes Aloes, and must be attributed to some species of A. Vulgaris and not to A. Perryi. This latter is now considered to be the source of Zanzibar or common "Hepatic" (monkey skin) variety.

**Solubility.**—Water dissolves 50 per cent.; the residue is pretty well inert; almost entirely soluble in Proof Spirit.

**Tests.**—*See under* Aloe Barbadensis.

(Belg., Port., Span. (Acibar) and U.S.; U.S. has also Aloe Purificata, which is Socotrine Aloes dissolved in Alcohol and evaporated to dryness. Cape Aloes is Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed. and Swiss.)

**Medicinal Properties.**—Purgative, but slow in action. Given in mesenteric disease and distended bowels. Although the purgative property acts chiefly on the lower portion of the intestinal canal, it produces on the upper part tonic and stomachic effects, when small doses only are given. One grain, with $\frac{1}{3}$ gr. Extract of Nux Vomica, is an excellent **pill** for this purpose and for relieving chronic dyspepsia. Aloes, combined with Rhubarb, Soap and Scammony, where there is a defective secretion of bile; with Iron and Myrrh for amenorrhœa.

Aloes was formerly supposed to aggravate Hæmorrhoids, but the Aqueous Extract commonly given in pills, and the Compound Decoction are free from objection.

*In very large doses is a powerful hepatic stimulant. It renders the bile more watery, but at the same time increases the secretion of the biliary matter by the liver.—Dr. Rutherford.*

**Dose.**—2 to 6 grs.

Used in the preparation of Aloin, Extractum Colocynthidis Co., Pilula Rhei Co., and Tinctura Benzoini Co.

### Preparations.

#### DECOCTUM ALOES COMPOSITUM.

Extract of Socotrine Aloes, 1; Myrrh, $\frac{1}{2}$; Saffron, $\frac{1}{2}$; Carbonate of Potassium, $\frac{1}{2}$; Extract of Liquorice, 4; Compound Tincture of Cardamoms, 30; Distilled Water, a sufficiency. Reduce the Extract of Aloes and Myrrh to coarse powder, and put them, together with the Carbonate of Potassium and Extract of Liquorice, into a suitable covered vessel with 40 of Distilled Water, boil gently for five minutes, then add the Saffron: let the vessel with the contents cool, then add the Tincture of Cardamoms, and covering the vessel closely, allow the ingredients to macerate two hours; finally strain through flannel, pouring as much Distilled Water over the contents of the strainer as will make the strained product measure 100.

This preparation should be kept in vessels from which air is excluded as far as possible.

4·375 grs. Extract of Aloes in 1 fl. oz. = (1 in 100).

**Dose.**—½ to 2 oz. as a mild cathartic, tonic, and antacid. Known to the public as the Baume de Vie.

It is noticed that much of the bitterness disappears on keeping.

**DECOCTUM ALOES COMPOSITUM "SQUIRE."** The same as the above formula, except that Fluid Extract of Liquorice (from fresh root), 10, is used in the place of Extract of Liquorice, 4.

The fluid extract is much better than the solid extract for covering the taste of Aloes; there is a marked difference in the taste of the two preparations, even when they practically contain the same amount of Liquorice. It is a most valuable aperient; 1 oz., or 1½ oz. equal to 6 grs. Aloes, acts naturally without griping, whereas 3 grs. of Aloes in a pill will probably purge and gripe too. A paper on Aloes (*Medical Times and Gazette*, Jan. 4, 1868) records the fact, that a very much larger dose of Aloes can be given in solution than in the solid form.

**ENEMA ALOES** *in the British Pharmacopœia occurs under both kinds of Aloes, indicating that either may be used.*

Aloes, 40 grs.; Carbonate of Potassium, 15 grs.; Mucilage of Starch, 10 oz.; mix for one enema.

As an anthelmintic 3 to 4 ounces only should be used.

### EXTRACTUM ALOES SOCOTRINÆ.

Socotrine Aloes in small fragments, 16 oz.; thoroughly mixed with one gallon (=160 oz.) of boiling Distilled Water, allowed to stand for twelve hours, then pour off the clear liquid, strain the remainder, and evaporate the mixed liquors by a current of warm air to dryness.

**Dose.**—1 to 3 grs. Brit. Ph. 2 to 6 grs. (same dose as crude drug).

(100 parts of Aloes yield 50 parts extract.)

The extract being more active than the Aloes, a smaller pill can be given, and it has the advantage of acting more pleasantly.

(Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Russ., Swed., Swiss and U.S.; not in the others.)

### PILULA ALOES SOCOTRINÆ.

Socotrine Aloes in powder, 2; Powdered Hard Soap, 1; Volatile Oil of Nutmeg, ⅛; Confection of Roses, 1. Mix. =(1 in 2).

**Dose.**—5 to 10 grs.

(Belg., Fr. and U.S., Aloes and Soap only, 1 in 2; Swiss, Aloes 10, Soap 1, Glycerine q.s.; not in the others.)

### PILULA ALOES ET ASAFŒTIDÆ.

Socotrine Aloes in powder, 1; Asafœtida, 1; Powdered Hard Soap, 1; Confection of Roses, about 1, or a sufficiency. (¼ Confection is sufficient). Mix. =(1 in 4).

Cathartic and antispasmodic.

**Dose.**—5 to 10 grs.

(U.S., 1 in 3; Belg. and Span., Pilulæ Fulleri, made with Aloes, Asafœtida, and other ingredients; not in the other Pharmacopœias.)

### PILULA ALOES ET MYRRHÆ.

Socotrine Aloes, 2; Myrrh, 1; Dried Saffron, ½; Treacle, 1; Glycerine a sufficiency. Mix. =(about 1 in 3).

Stimulant and cathartic.

The formula for Pil. Rufi in 1557 was Aloes, 2; Myrrh, 1; Saffron, 1; White Wine, a sufficiency.

**Dose.**—5 to 10 grs.

(Austr., Belg., Port. and Swed., similar to Brit.; U.S., with Aromatic Powder in place of Saffron; not in the other Pharmacopœias.)

### TINCTURA ALOES.

Socotrine Aloes in coarse powder, 1; Extract of Liquorice, 3; Proof Spirit, a sufficiency; macerate seven days in 30 of the Spirit, agitating occasionally; filter and add sufficient Proof Spirit to make 40. =(1 in 40).

**Dose.**—1 to 2 drms.

(Belg., 1 in 5; Dutch, Fr., Russ., Span. and Swiss, 1 and 5; Hung. and Port., 15 in 100; Swed. and U.S., 1 in 10: all are by weight except U.S.)

### VINUM ALOES.

Socotrine Aloes, 1½ oz.; Ginger in coarse powder, 80 grs.; Cardamom Seeds, bruised, 80 grs.; Sherry, 40 oz.; digest seven days, filter, and make up with Sherry to 40 oz.

About 2 grs. in each fluid drachm=(1 grain in 26⅔ minims).

**Dose.**—1 to 2 drms.

(Not in the other Pharmacopœias.)

### Not Official.

**TINCTURA ALOES COMPOSITA** (Elixir ad longam vitam).

Belg.—Aloes, 20; Agaric, 3; Gentian, 3; Rhubarb, 3; Zedoary, 3; Saffron, 2; Electuarium Theriacale, 3; Alcohol (50 p. c.), 1000.

Fr.—Aloes, 20; Agaric, 2·5; Gentian, 2·5; Rhubarb, 2·5; Zedoary, 2·5; Saffron, 2·5; Electuarium Theriacale, 2·5; Alcohol (60 p. c.), 1000.

Ger.—Aloes, 30; Gentian, 5; Rhubarb, 5; Zedoary, 5; Saffron, 5; Alcohol (68 p. c.), 1000.

Russ.—Aloes, 45; Agaric, 5; Gentian, 5; Rhubarb, 5; Zedoary, 5; Saffron 5; Alcohol (70 p. c.) 1000.

Span.—Aloes, 35; Agaric, 4; Gentian, 4; Rhubarb, 4; Zedoary, 4; Saffron, 4; Electuarium Theriacale, 4; Alcohol (60 p. c.), 1730.

Swiss.—Aloes, 6; Agaric, 1; Gentian, 1; Rhubarb, 1; Zedoary, 1; Saffron, 1; Myrrh, 1; Alcohol (70 p. c.), 200.

All are by weight.

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## ALOIN.

ALOIN.

$C_{16}H_{18}O_7$.

A yellow, inodorous crystalline substance extracted from Aloes by solvents and purified by recrystallisation. Not readily altered in acidified or neutral solutions; rapidly altered in alkaline fluids. As obtained from the different varieties of Aloes the products differ slightly, but their medicinal properties are similar.

**B. P. Dose.**—$\frac{1}{2}$ to 2 grains.

(U.S.; not in the other Pharmacopœias.)

The later literature on the subject of Aloin will be found summarized *C D.*, '90, i. 331.

It would appear that the Aloins may be classified as follows:—

**BARBALOINS.**—Yielding on oxidation Chrysammic, Aloetic, and Picric Acids.

**α-barbaloin,** which gives a red colour with *cold* Nitric Acid (1·42), obtained from Barbadoes and Curaçao Aloes.

**β-barbaloin,** which requires either fuming Nitric Acid, or a *hot* Acid of ordinary strength to give the *red* colouration. This variety is yielded by Socotrine, Zanzibar, and Jefferabad Aloes.

**NATALOIN.**—Yields on oxidation Picric but not Chrysammic Acid. This is a distinct species, from Natal Aloes only, having a formula $C_{24}H_{26}O_{10}.\ H_2O$. Softens at 180° C., and melts at 210° C.

It may be assumed that commercial "Aloin" is A-barbaloin, and it is to this variety only that the name should be applied. Its general characters are described above. Its formula is $C_{16}H_{16}O_7$, with about three molecules of water of crystallisation, and its melting point when anhydrous 147° C.

**Solubility.**—1 in 400 of Water; 1 in 70 of Rectified Spirit; freely soluble in hot Water; nearly insoluble in Ether.

**Medicinal Properties.**—Merck (Bulletin '91, 65) finds $1\frac{1}{2}$ to 3 grains almost certain in action, especially when combined with alkalies or Sulphate of Iron. A **hypodermic injection** of $\frac{3}{4}$ grain dissolved in Formamide has also been used.

**NATALOIN,** although effective with cats and dogs, is found to have no action on man, except in cases where an exclusively animal diet had been used for some days previously.

### Not Official.

**PILULA ALOINÆ COMPOSITA.**—Aloinæ, Extracti Nucis Vomicæ, Ferri Sulphatis, Pulv. Myrrhæ, Saponis, ana $\frac{1}{2}$ gr.—*L.* '87, i. 2.

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Not Official.

## ALTHÆÆ RADIX.

MARSHMALLOW.

The root of *Althæa officinalis,* which is very mucilaginous. When decorticated and dried it is much used as a powder in the preparation of lozenges and pill masses.

(Austr., Belg., Dan., Dutch, Fr. (Guimauve), Ger., Hung., Norw., Port., Russ., Span. (Altea), Swed., Swiss and U.S.)

**Medicinal Properties.**—It is much employed on the Continent as a demulcent in irritation and inflammation of the mucous membranes.

### Preparations.

**SYRUPUS ALTHÆÆ.**—Macerate 3 of Althea Root in 40 of Water for twelve hours: strain, press, and filter until 32 have passed through; to this add 64 of Sugar, dissolve warm, and heat the Syrup to boiling; when cold, skim and strain through flannel.

(In all the Foreign Pharmacopœias; but they differ somewhat in the proportion of Root employed and in manipulation.)

**TROCHISCI ALTHÆÆ** (*T.H.*).—About 1 grain in each lozenge. Emollient. Valuable after excision of tonsils or uvula.

(Lozenges are official in Austr. and Fr.; not in the other Pharmacopœias.)

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### Not Official.

## ALUMINIUM.

### ALUMINIUM.

### Al, eq. 27.

A silver-white metal, sonorous, and lighter than glass, having sp. g. 2·560.

Indicated by Sir Humphrey Davy in 1808; made by Wöhler, by decomposing its chloride with Sodium in 1828, and first produced in ingots by M. Deville in 1854. It resists the action of cold concentrated Nitric and Sulphuric Acids, but is readily attacked by Hydrochloric Acid. Its oxide, being identical with Sapphire, forms an impermeable crust on the surface of the metal, and protects it from further action of the air. On account of its extreme lightness and tenacity, this metal has attracted considerable attention for many years. At one time it was very expensive, but, owing to improved methods of extraction, the cost has been much reduced, and it is now possible to employ it for many articles in common use where lightness is required. It is only one-third the weight of Iron. A perfect method of soldering it, however, has still to be discovered.

Neither Aluminium nor Alumina is in the British Pharmacopœia. Alumina, however, is much used to fine turbid medicinal waters and other solutions, and is easily obtained by adding in excess a solution of Carbonate of Potassium or Sodium to a solution of Alum, and well washing the precipitate.

### Not Official.

**CIMOLITE** is composed of Alumina, 23; Silica, 63; Oxide of Iron, 1·25; Water, 12.

**FULLER'S EARTH** is composed of Alumina, 10; Silica, 53; Lime, 0·5; Magnesia, 1·25; Oxide of Iron, 9·5; Water, 24.

**KAOLIN**, a Silicate of Aluminium. See p. 329.

**SOAPSTONE, CRETA GALLICA**, is a Silicate of Aluminium and Magnesium. Is used in prurigo and as a dusting powder for infants, alone or mixed with equal parts of Oxide of Zinc or Calamine.

**ACETATE OF ALUMINIUM SOLUTION** (Ph. Ger.)—A clear colourless liquid, obtained by double decomposition between Sulphate of Aluminium and Acetate of Lime, with an acid reaction and a faint odour of Acetic Acid. Sp. g. 1·044—1·046.

A good antiseptic, preferred by some to Carbolic Acid for dressing lacerated wounds. —*T.G.* '85, 727; '86, 573.

**ACETO-TARTRATE OF ALUMINIUM.**—Crystals soluble in their own weight of water.

A powerful, non-poisonous antiseptic; also an astringent caustic.

30 to 60 grs. in a pint of water makes a useful **gargle** or **douche**.—*L.M.R.* '86, 433; *L.* '88, i. 339.

**CHLORIDE OF ALUMINIUM SOLUTION** (*T.H.*).—Obtained by dissolving Aluminium Hydrate in Hydrochloric Acid. A pale yellow liquid. Sp. g. 1·250. **Gargle,** 12 mins. to 1 oz. of water; **Spray,** 3 mins. to 1 oz.; **Paint,** 15 mins. to 1 oz. Astringent and antiseptic.

A solution (sp. g. 1·15) has been used largely as a disinfectant under the name **Chloralum.**

**NITRATE OF ALUMINIUM.**—A **solution** (4 or 6 grains in 1 oz. of Water) has been used with success in pruritus vulva.

**NAPHTHOL-SULPHONATE OF ALUMINIUM** (**Alumnol**).—A whitish powder, readily soluble in water, introduced as a new antiseptic.—*P.J.*, xxiii., 605; *C.D.* '93, i. 94.

**OLEATE OF ALUMINIUM.**—A powder. Mixed with equal parts of Lard, is used as a styptic and antiseptic, in checking the muco-purulent discharges in eczema.—*L.* '84, ii. 123.

# ALUMEN.

## ALUM.

$Al_2 3SO_4,\ K_2SO_4,\ 24H_2O$, eq. 948.

$Al_2 3SO_4,\ (NH_4)_2SO_4,\ 24H_2O$, eq. 906.

The double Sulphate of Aluminium and Potassium (Potash Alum), or of Aluminium and Ammonium (Ammonia Alum), crystallised from solution in Water, and forming colourless transparent crystalline masses, exhibiting the faces of the regular octahedron.

Although Potash and Ammonia Alum are both Official, the Potash Salt only is used commercially, Potash Salts as a rule being cheaper than those of Ammonia. About the year 1880, however, this was reversed, Ammonia Alum being the commercial Salt, and between 1867 and 1885 was the only one Official.

In **Soda-Alum** the Potassium is replaced by Sodium in the formula, but in **Chrome-Alum** and **Iron-Alum** it is the Aluminium (not the Alkali) which is replaced by Chromium or Iron respectively.

**Solubility.**—1 in 11 of Water; 3 in 1 of boiling Water; Potash Alum, 1 in 3 of Glycerine; Ammonia Alum, 1 in 1¼ of Glycerine. Insoluble in Rectified and Proof Spirit.

Alum when heated melts in its own water of crystallisation.

**Tests.**—Its aqueous solution gives a white precipitate (Hydrate of Aluminium) with solution of Potash or Soda, soluble in excess; gives a white precipitate with Chloride of Barium (Sulphate of Barium); affords little or no colour with Ferrocyanide or Ferricyanide of Potassium—indicating absence, or only a trace of Iron.

Potash Alum is distinguished from Ammonia Alum by the latter giving off Ammonia when its aqueous solution is heated with Potash or Soda.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Allume), Norw., Port., Russ., Span. (Alumbre), Swed., Swiss, and U.S. use Potash Alum only.)

**Medicinal Properties.**—Astringent, used as a **gargle** for relaxed throat, 10 grs. in 1 oz. of Water; as an **injection** in leucorrhœa, 60 grs. in a pint of Water; as a **nasal douche**, 4 grs. in 1 oz. of Water; as a **snuff** in epistaxis, 3 grs. mixed with ½ gr. of Starch; as a **collyrium** to the eyes in children and adults when there is mucus or purulent matter, 2 to 6 grs. in 1 oz. of Water; 10 to 15 grs. three times a day has been given for internal hæmorrhages, for menorrhagia, and in cases of lead poisoning. A **saturated solution** in Water forms an excellent styptic for hæmorrhage, leech bites, &c. Given in the later stages of whooping cough. It has also been recommended as an emetic in croup.

**Dose.**—10 to 20 grs.; for children 2 to 5 grs. A teaspoonful in Honey or Treacle acts as an emetic.

**Incompatibles.**—Alkalies and their Carbonates, Tannic Acid, and astringent decoctions and infusions.

## Preparations.

### GLYCERINUM ALUMINIS.

Alum, in powder, 1; Glycerine, 5. Stir together in a porcelain dish, gently applying heat until solution is effected; set aside, and pour off the clear fluid from any deposited matter.

=(By weight 1 in $7\frac{1}{4}$, by measure 1 in $5\frac{1}{2}$.)

Pure Alum should and does dissolve clear in Glycerine, but commercial Pulv. Aluminis as a general rule will not dissolve without residue except after prolonged boiling.

Sp. g. about 1·3.

A powerful local astringent. When diluted with Water it forms a useful gargle.

**ALUMEN EXSICCATUM.** Dried Alum. *N.O.Syn.*—Alumen Ustum. Burnt Alum.

Heat Potassium Alum in a porcelain capsule or other suitable vessel till it liquefies; raise and continue the heat, not allowing it to exceed 400° F. (204·4° C.), till aqueous vapour ceases to be disengaged, and the salt has lost between 45 and 46 per cent. of its weight; reduce the residue to powder, and preserve it in a well-stoppered bottle.

It is slowly but completely soluble in Water.

As a rule commercial samples are not: four samples gave 2 to 8 per cent. insoluble in Water.

Potash Alum is here specified, but Ammonia Alum at 400° F. loses nothing but Water, and was ordered in 1867 B.P.; although it would appear (*P.J.* xiii. 838) that in 1882 the commercial article was made from Potash Alum, in spite of the fact that none but Ammonia Alum was Official.

For external use only. Escharotic, used as a stimulant to indolent ulcers, also in ulcerative stomatitis.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

## Not Official.

**ALUM CATAPLASM, or POULTICE.**—Alum, 60 grs.; the whites of two eggs. For chilblains; also a good application to black bruises.

**ALUM GARGLE.**—Broken rose petals, 3 drms.; Diluted Sulphuric Acid, 3 drms.; cold Distilled Water, 10 oz.; digest for two hours, and strain 8 oz.; then add Alum, 2 drms.; Sugar, 4 drms.; Rectified Spirit, 4 drms.; dissolve. This kept well for seven years.

When used, to be mixed with an equal bulk of Water.

Several formulæ for Alum gargle will be found in Squire's Pharmacopœias of the London Hospitals.

**GOSSYPIUM ALUMINIS** (*T.H.*).—Contains about 30 per cent. of Alum.

**ALUM WHEY.**—Alum, 120 grs. boiled in a pint of Milk. **Dose.**—A wineglassful.

**FERRI ET AMMONII SULPHAS.**—Ammonio-Ferric Alum, U.S.P.

Iron Alum is an Alum in which Iron takes the place of Aluminium. It is especially useful in bleeding from the kidneys; it arrests the hæmorrhage and the anæmia that accompanies it; it is considered more astringent than Alum.

The aqueous solution will, even after filtration, let fall Peroxide of Iron, unless slightly acidified with Diluted Sulphuric Acid.

**Dose.**—5 to 10 grs.

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## AMMONIACUM.

AMMONIACUM.

A gum-resinous exudation from the stem (after being punctured by beetles) of *Dorema ammoniacum*, in tears or in nodular masses of agglutinated tears, of a pale yellow colour changing to a cinnamon brown on long exposure to the air, brittle when cold, but readily softens with heat, and when broken has an opaque white and shining surface. It is coloured yellow by Caustic Potash, and bright orange by solution of Chlorinated Soda.

It is collected in Persia.

**Solubility.**—Sparingly in Water, but forms with it a nearly white emulsion; when 50 grains are digested in 2 oz. of Rectified Spirit, 40 grains are dissolved; with Proof Spirit 30 grains are dissolved.

(Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.; Fr., purified by 60 p. c. Alcohol.)

**Medicinal Properties.**—Antispasmodic, stimulant, expectorant; useful in chronic catarrh, bronchitic affections, and asthma, either in mixture or in pill.

**Dose.**—10 to 20 grs.

Contained in Emplastrum Galbani, in Pilula Scillæ Composita, and Pil. Ipecacuanhæ cum Scilla.

### Preparations.

**EMPLASTRUM AMMONIACI CUM HYDRARGYRO.** *See* HYDRARGYRUM.

As the value of this preparation depends chiefly upon the Mercury it contains, the formula is given under Hydrargyrum.

**MISTURA AMMONIACI.**

Ammoniacum, in coarse powder, ¼ oz., rubbed down with Water 8 oz., gradually added; strain through muslin. = (1 in 32).

**Dose.**—½ to 1 oz. as an expectorant; may be combined with 15 minims of Tincture of Squill, or 15 minims of Fetid Spirit of Ammonia.

(Span. (Emulsion), 1 in 36 with White Wine; U.S. (Emulsum Am.) 1 in 25; not in the others.)

### Not Official.

**MISTURA AMMONIACI COMP.**—Comp. Tinct. Camphor, 30 mins.; Oxymel of Squill, 30 mins.; Ammoniacum Mixture, to 1 oz.—*Consumption Hospital.*

Not Official.

## AMMONIUM.

AMMONIUM.

$NH_4$, eq. 18.

According to Roscoe, Ammonium has been isolated, but it does not seem to be able to exist in an uncombined state, unless under high pressure and at a low temperature; it is a dark blue liquid possessing a metallic lustre, and very readily decomposes into Ammonia and Hydrogen.

## AMMONIA.

AMMONIA.

This important compound is chiefly produced artificially, but it exists in some volcanic products, and is discoverable in sea-water. It is found also in putrid urine and in the salts produced by the decomposition of animal matter.

Its history in the form of Sal Ammoniac is very ancient. This salt was manufactured in very early times from soot afforded by the combustion of camels' dung, from which it was obtained by sublimation. The process was chiefly conducted in the neighbourhood of the temple of Jupiter Ammon in Egypt, and to this circumstance it owes its name ; it was afterwards obtained either from putrid urine or by the destructive distillation of animal substances.

The chief source at present is the liquor from the gas-works and from Paraffin Shale, also from iron smelting furnaces ; but the Ammonia produced in this way is apt to contain impurities, particularly the organic bases known as " the compound Ammonias."

The purest form of Ammonia is that obtained as a by-product in the manufacture of Borax. The Boracic Acid of Tuscany, when saturated with Soda, evolves very considerable quantities of pure Ammonia, and the Liquor Ammoniæ and Carbonate of Ammonium, produced in this way, are sold under the name of "Volcanic Ammonia," but they are scarce at the present time. This has led to the better purification of the Ammonias from Coal, which can now be obtained sufficiently pure for all pharmaceutical purposes.

The distinguishing tests for Ammonium Salts are : (1) Smell of Ammonia on being heated with fixed alkali ; (2) Brown precipitate or colouration with Nessler's re-agent.

All the Ammonium Salts likely to be used in medicine volatilise completely on ignition, with the exception of Borate and Phosphate, the acids of which are non-volatile.

*The whole of the Preparations of Ammonia are here grouped.*

## AMMONIÆ LIQUOR FORTIOR.

STRONG SOLUTION OF AMMONIA.

Contains 32·5 per cent. (by weight) of Ammoniacal Gas, $NH_3$, eq. 17, dissolved in Water.

A colourless liquid, with a characteristic and very pungent odour, and a strong alkaline reaction.

**Tests.**—Sp. g. ·891. 52·3 grains by weight requires for neutralisation 1000 grain-measures of the volumetric solution of Oxalic Acid. When diluted with four times its volume of Distilled Water, it does not give precipitates with solution of Lime, Oxalate or Sulphide of Ammonium, or Ammonio-Sulphate of Copper, and when treated with an excess of Nitric Acid is not rendered turbid by Nitrate of Silver or by Chloride of Barium—indicating freedom from carbonates, lime, metals, sulphides, chlorides, and sulphates.

Commercially Liquor Ammoniæ Fort. is generally sold as of sp. g. ·880.

Best given in the more diluted state, as in Liq. Ammoniæ.

(Belg. (Ammonia Liquida), sp. g. ·935, 17 per cent.; Fr. (Ammoniaque Liquide), sp. g. ·925; Ital. (Ammoniaca), sp. g. ·925, 20 per cent.; Port. (Ammonia Liquida), sp. g. ·916; Span. (Amoniaco Liquido), sp. g. ·923; U.S., sp. g. ·901, 28 per cent.; *see* also Liquor Ammoniæ.)

Used in the preparation of Ammonii Phosphas, Linimentum Camphoræ Compositum, Liquor Ammonii Citratis Fortior, Spiritus Ammoniæ Aromaticus, Spiritus Ammoniæ Fœtidus, Tinctura Opii Ammoniata.

**Antidotes.**—Acetic Acid or Vinegar well diluted with Water; demulcent drinks.

## Preparations.

### LIQUOR AMMONIÆ. Solution of Ammonia.

Strong Solution of Ammonia, 1; Distilled Water, 2; mix. Contains 10 per cent. by weight of Ammonia, $NH_3$.

**Tests.**—Sp. g. ·959. 85 grains by weight requires for neutralisation 500 grain-measures of the volumetric solution of Oxalic Acid.

(Austr., Dan., Ger., Hung., Ital., Norw., Russ., Swed., Swiss and U.S. (10 per cent.) sp. g. ·960; Dutch, sp. g. ·958—·960; Belg., Fr., Ital., Port., Span. and U.S., *see* Ammon. Liq. Fort.)

**Medicinal Properties.**—Stimulant, antacid, and antispasmodic; relieves nervous headache, and is useful in pneumonia, bronchitis, and dyspepsia. Counteracts the after-effects of alcohol, and delirium tremens. Stimulant in low states of the system, as typhoid forms of fever. Externally (applied to the nostrils) in syncope; an excellent application to the sting of a wasp or the bite of an adder. On the skin it is a powerful rubefacient, and in embrocations, it is used as a counter-irritant for pains and stiffness of joints, &c.

Used in the preparation of Ammonii Benzoas, Ferri et Ammonii Citras, Ferri et Quininæ Citras, Ferrum Tartaratum, Injectio Morphinæ Hypodermica, Linimentum Ammoniæ, Linimentum Hydrargyri, Liquor Bismuthi et Ammonii Citratis, Tinctura Quininæ Ammoniata.

### LINIMENTUM AMMONIÆ.

Solution of Ammonia, 1; Olive Oil, 3; mix with agitation until the thick emulsion at first produced becomes of such a consistence that it can be poured from a bottle. = (1 in 4).

This does not appear to be a very satisfactory preparation, gradual saponification taking place. It is best made when wanted.

Cotton Seed, Sesame and Nut Oils have each been recommended, but Cotton Seed is the only Oil which makes a satisfactory and permanent emulsion.

A counter-irritant.

(Austr., Dutch and Ital., 1 and 4 Olive Oil; Belg. and Fr., 1 and 9 Almond Oil; Ger., Liq. Am. 1, Olive Oil 3, Poppy Oil 1; Hung., 1 and 4 Sesame Oil; Port., 1 and 4 Almond Oil; Russ., Liq. Am. 1, Olive Oil 3, Sesame Oil 1; Span., 1 and 7½ Olive Oil; Swed., 1 and 3 Olive Oil; Swiss, 1 and 3 Poppy or Sesame Oil; U.S., Am. 35, Alcohol 5, Cotton Seed Oil 60; not in Norw. All are by weight except U.S.)

**SPIRITUS AMMONIÆ FŒTIDUS.** FETID SPIRIT OF AMMONIA.

Strong Solution of Ammonia, 2; Asafœtida in small pieces, 1½; Rectified Spirit, a sufficiency; macerate the Asafœtida in 15 of the Spirit twenty-four hours, distil, add the Ammonia to the distillate, and make up with Rectified Spirit to 20.

**Test.**—Sp. g. ·847.

Stimulant, antispasmodic, combined with Ammoniacum Mixture excellent for catarrh and asthma of old people.

**Dose.**—½ to 1 drachm.

(Not in the other Pharmacopœias.)

### Not Official.

**ALCOHOL AMMONIA.**—Absolute Alcohol saturated with Ammonia Gas. It contains about 14 per cent. $NH_3$. Sp. g. ·858.

It is used in filling and renovating Smelling Salt bottles.

**LOTIO CRINALIS.**—Ol. Amygdal. 1 oz.; Liq. Ammon. Fort. 1 oz.; Sp. Rosmar. 4 oz.; Aq. Mellis, 2 oz.; mix.

**TINCT. AMMON. COMP.—EAU DE LUCE.**—Mastic, 2 drs.; Rectified Spirit, 9 drs.; Ol. Lavand. 14 min.; Strong Liquor Ammoniæ, 20 oz.: dissolve.

Stimulant, antispasmodic. Used in tropical climates as an application to snake bites.

**Dose.**—5 to 10 minims in Water.

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## AMMONII ACETATIS LIQUOR FORTIOR.

### STRONG SOLUTION OF ACETATE OF AMMONIUM.

$NH_4.C_2H_3O_2$, eq. 77, dissolved in Water.

Carbonate of Ammonium, 15½; Acetic Acid, 50, or a sufficiency; Distilled Water, a sufficiency.

Crush the Carbonate of Ammonium and add it gradually to 45 of the Acid; then add more of the Acid until a neutral liquid results; lastly add sufficient Distilled Water to yield 60 of product. The solution should be stored in bottles free from lead.

It is very difficult to say when this solution is "neutral." The same solution may appear slightly alkaline to red, and slightly acid to blue litmus paper. Phenolphthalein and Methyl Orange are alike useless. Dilution of a concentrated solution always makes it appear more acid, and it is impossible to expel Carbonic Acid without expelling Ammonia at the same time.

It is our practice to make it so that when diluted to the extent of Liquor Ammonii Acetatis, it will slightly redden blue litmus paper.

In making this preparation from Glacial Acetic Acid and strong Solution of Ammonia the approximate proportions are: Glacial Acetic Acid 1; Strong Solution of Ammonia 1; Water 1½: dilute the Ammonia with the Water and add it gradually to the Acid, keeping the liquid cool by immersion in cold Water; make "neutral" as described above by slight addition of Acid or Ammonia, and adjust with Water to specific gravity. May have a disagreeable odour, *see* p. 8.

**Tests.**—Sp. g. 1·073. A little of the solution heated in a test tube to expel Carbonic Acid should be neutral to test papers.

When no allowance is made for the low strength in Ammonia of the commercial Carbonate, the sp. g. of this Liquor may be expected to be low. This may be avoided by making the Acetic Acid the fixed quantity, and the Carbonate of Ammonium "a sufficiency," as in B.P. 1867.

**Dose.**—20 to 60 minims diluted with Water.

### Preparation.

**AMMONII ACETATIS LIQUOR.** *N.O.Syn.*—MINDERERUS SPIRIT.

Strong solution of Acetate of Ammonium, 1; Distilled Water sufficient to produce 5: mix.

The only reason for using Carbonate of Ammonium and 33 per cent. Acetic Acid (when making the strong Liquor), in preference to Solution of Ammonia and Glacial Acetic Acid, is assumed to be that the Carbonic Acid improves the flavour; therefore the dilute Solution should either be made directly from the Carbonate, or the Liquor Ammonii Acetatis Fortior should be diluted with Carbonic Acid Water. The amount of Gas contained in the Official Liquor is practically nil, except when freshly prepared.

The solution should be stored in bottles free from Lead.

**Specific Gravity.**—This is given in B.P. as 1·022, but if a strong Liquor of sp. g. 1·073 be diluted as above the resulting liquor will be sp. g. 1·018.

(Austr. and Ital., sp. g. 1·030; Belg. and Port., sp. g. 1·029; Fr. and Span., sp. g. 1·036; U.S.: all made with Carbonate. Dan., sp. g. 1035-1040; Norw., and Swed. (20 p.c.), sp. g. 1·038 to 1·042; Dutch, Ger., Hung., Russ. and Swiss., sp. g. 1·032 to 1·034; all made with Caustic Ammonia.)

**Medicinal Properties.**—Diaphoretic and refrigerant. Internally, it increases the secretion by the skin and kidneys, therefore useful in febrile and inflammatory diseases, and in dysmenorrhœa. Given in full doses for alcoholism. Externally, in the proportion of 1 to 10 of Water, as a **collyrium** in chronic ophthalmia, or mixed with weak Spirit for a cooling **lotion.**

**Dose.**—2 to 6 drms.; for children, ½ to 1 drm.

A nice fever mixture is made with Liq. Ammon. Acet. ʒij, Ammon. Carbon. gr. viij, Succ. Limon. ʒij, Syrup. ʒj, Aquæ Camphor. ℥ss, Aquæ ad ℥iv: mix; a fourth part every six hours.

**Incompatibles.**—Acids, Potash, Soda, and their Carbonates, Lime Water, Salts of Lead and Silver.

## AMMONII BENZOAS.

BENZOATE OF AMMONIUM.

$NH_4C_7H_5O_2$, eq. 139.

Colourless laminar crystals.

Solution of Ammonia, 3, or a sufficiency; Benzoic Acid, 2; Distilled Water, 4; dissolve and evaporate, keeping the Ammonia in slight excess, and set aside to crystallise.

When 3½ of Ammonia are used, it makes a neutral salt.

**Solubility.**—Of the neutral Salt, 1 in 5 of Water; 1 in 22 of Rectified Spirit; 1 in 8 of Glycerine.

**Tests.**—When heated, it sublimes without residue. Its aqueous solution, if not too dilute, deposits Benzoic Acid when it is acidulated with Hydrochloric Acid; when heated with solution of Potash it evolves Ammonia; with persalts of Iron it gives a bulky reddish-yellow precipitate.

Its solutions, either aqueous or alcoholic, partially decompose and give off Ammonia on being boiled.

(Fr., Port., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Diuretic, employed in dropsy, and in gout when chalk-stones are deposited near the joints. It is more soluble than Benzoic Acid, and therefore acts more quickly. Has been recommended in 15 grain doses for scarlet fever. Is valuable in catarrhus vesicæ with alkaline urine, also in cases of phosphatic deposit. The Ammonia does not, like Potash and Soda, pass through the kidneys. In reference to this, *see* foot of p. 13.

*Stimulates the liver, but not quite so powerfully as the Benzoate of Soda; neither of them stimulates the intestinal glands.—Dr. Rutherford.*

**Dose.**—10 to 20 grains in Water.

**Incompatibles.**—Acids, Liquor Potassæ, and Persalts of Iron.

Not Official.

## AMMONII BORAS.

A crystalline salt, with an alkaline reaction.

**Solubility.**—1 in 15 of Water.

**Medicinal Properties.**—Has been used with success in renal and vesical calculi.

For renal colic, 20 grains every two hours until free passage of urine takes place, then 15 grains three times a day.—*T.G.* '87, 623.

5 grains three times a day have been given in phthisis —*L.* '87, ii. 277.

## AMMONII BROMIDUM.

BROMIDE OF AMMONIUM.

*N.O.Syn.*—Ammonium Bromatum.

$NH_4Br$, eq. 98.

In small colourless crystals, which may be sublimed unchanged.

**Solubility.**—1 in 1½ of Water; 1 in 15 of Rectified Spirit.

**Tests.**—Its aqueous solution, when heated with solution of Potash, should evolve Ammonia; when mixed with a little Chlorine Water and agitated with Chloroform, colours the latter red (Bromine); gives only a faint cloudiness with Chloride of Barium (Sulphate). It does not give an immediate yellow colour on being moistened with diluted Sulphuric Acid (Bromate). Five grains dissolved in an ounce of Distilled Water, to which two drops of solution of Yellow Chromate of Potassium have been added, require not more than 514·5 and not less than 508·5 grain-measures of the volumetric solution of Nitrate of Silver to produce a permanent red precipitate.

A low figure indicates Iodide, moisture, or some other impurity not indicated by Silver Nitrate; a high figure indicates presence of Chloride.

Its aqueous solution does not exhibit a blue colour with Mucilage of Starch and a drop of Chlorine or Bromine Water—showing absence of Iodine.

(Austr., Dan., Dutch, Fr., Ger., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—An excellent nervine, good in hysterics; especially useful for sleeplessness of nervous persons where there is no organic disease; relieves headache and neuralgic pain, also the intolerable itching in prurigo. Sedative in pharyngeal and laryngeal irritation, especially in whooping cough; dose for children, 1 to 5 grs. three times a day in Water.

**Dose.**—5 to 20 grains.

**Incompatible.**—Spirit of Nitrous Æther.

Not Official.

**LOZENGES,** containing 2 grains of Bromide of Ammonium in each. Dose, 1 to 3 lozenges. Useful in whooping cough.

## AMMONII CARBONAS.

CARBONATE OF AMMONIUM.

*B.P.Syn.*—AMMONIÆ SESQUICARBONAS.

$N_3H_{11}C_2O_5$, eq. 157.

It is considered to be a compound of Acid Carbonate of Ammonium, $NH_4HCO_3$, with Carbamate of Ammonium, $NH_4NH_2CO_2$, and the compound molecule is usually regarded as containing one molecule of each of these salts.

The commercial article only approximates in composition to this formula.

Sublimed from a mixture of Carbonate of Calcium and Sulphate or Chloride of Ammonium, and then resublimed.

Translucent crystalline masses, which have a strong Ammoniacal odour and an alkaline reaction.

**Solubility.**—1 in 4 of Water; 1 in 200 of Spirit; 1 in 5 of Glycerine.

**Tests.**—52·3 grains dissolved in an ounce of Distilled Water are neutralised by 1000 grain-measures of the volumetric solution of Oxalic Acid. Volatilises entirely when heated. If diluted Nitric Acid be added to it in slight excess it will give no precipitate with Nitrate of Silver or Chloride of Barium (absence of Chlorides and Sulphates).

We have not found a sample (even Volcanic) which gives the full amount of Ammonia required by the volumetric test; different samples gave 91—96 per cent. of the prescribed amount, which must be taken into account in all preparations made from it.

Used in the preparation of Bismuthi Carbonas, Ferri Carbonas Saccharata, Liquor Ammonii Acetatis Fortior.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Antacid, antiseptic, stimulant, sudorific, and expectorant. Frequently combined with Ipecacuanha in bronchitis. 3 to 5 grain doses have been given with good effect in scarlet fever. Rarely as an emetic in ½ drm. doses. 60 grs. of this, or two tablespoonfuls of Sal Volatile to 20 oz. of warm water, sponged on the body, is refreshing.

Has been recommended in full and continuous doses in cholera, in the place of alcoholic stimulants.—*B.M.J.* '85, ii. 380.

**Dose.**—3 to 10 grains in solution.

15 grains dissolved in water are taken with 17 grains of Citric Acid to form a saline draught.

**Incompatibles.**—Acids, Acidulous Salts, Earthy Salts, and Lime Water.

## Preparation.

**SPIRITUS AMMONIÆ AROMATICUS.** *B.P.Syn.*—Spiritus Ammoniæ Compositus. Sal Volatile. The latter more properly applies to Carbonate of Ammonium; this preparation is Spirit of Sal Volatile.

Carbonate of Ammonium, 4 oz.; Strong Solution of Ammonia, 8 oz.; Volatile Oil of Nutmeg, 4½ drms.; Oil of Lemon, 6½ drms.; Rectified Spirit, 6 pints (= 120 oz.); Water, 3 pints (= 60 oz.).

Place the Oils of Lemon and Nutmeg and Rectified Spirit with the Water in a retort; distil 7 pints (140 oz.), and then distil and separately collect an additional 9 oz. Place the 9 oz. of distillate, together with the Carbonate of Ammonium and the Strong Solution of Ammonia, in a bottle holding rather more than a pint (20 oz.); securely cork the bottle, and gently warm it in a water-bath to 140° F. (60° C.), shaking from time to time until all the salt has dissolved. Filter if necessary, when cold, through a little cotton wool, and gradually mix it with the 7 pints of distilled Spirit. The product should measure one gallon (160 oz.).

It is much better to dissolve the Carbonate of Ammonium and Ammonia in 9 oz. of Water while the distillation is proceeding, and not to carry it past 140 oz. If the Carbonate be roughly powdered, solution will be complete, without heating, in a few hours.

**Tests.**—Sp. g. ·896. One fluid ounce requires for neutralisation 558 grain-measures of the volumetric solution of Oxalic Acid. One fluid ounce, after the addition of 330 grain-measures of the test solution of Chloride of Barium, should yield, after filtration, a further precipitate when more of the reagent is added.

A domestic remedy for nervous headache, more useful when combined with Bromide of Ammonium.

**B.P. Dose.**—30 to 60 minims.

(U.S., a *mixture*, Fr. (Alcoolat Aromatique Ammoniacal) and Port., *distilled*; all contain Carbonate, but differ considerably.

Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Russ., Span., Swed. and Swiss have Liquor or Spiritus Ammonii Anisatus, a mixture of Oil of Anise, Spirit, and Liq. Ammon., but in slightly different proportions.)

Used in the preparation of Tinctura Guaiaci Ammoniata, and Tinctura Valerianæ Ammoniata.

### Not Official.

**SPIRITUS or LIQUOR AMMONII ANISATUS.**

Austr., Ger., Ital. and Span.—Oil of Anise, 1; Alcohol, 24; Solution of Ammonia, 5.

Belg., Hung. and Russ.—Oil of Anise, 1; Alcohol, 24; Solution of Ammonia, 6.

Dan., Norw. and Swed.—Oil of Anise, 1; Alcohol, 32; Solution of Ammonia, 7.

Dutch.—Oil of Anise, 1; Alcohol, 19; Solution of Ammonia, 5.

Swiss.—Oil of Anise, 3; Alcohol, 77; Solution of Ammonia, 20.

All by weight.

**LIQUOR VOLATILIS CORNU CERVI**, or **SPIRIT OF HARTSHORN**.—Solution of Carbonate of Ammonia of the old Pharmacopœias, distilled from Hartshorn.

**HARTSHORN AND OIL.**—1 of Sp. Hartshorn and 3 of Oil of Almonds: mix.

## AMMONII CHLORIDUM.

CHLORIDE OF AMMONIUM.

*B.P.Syn.*—SAL AMMONIAC.

$NH_4Cl$, eq. 53·5.

Usually prepared by sublimation; colourless, inodorous, translucent, fibrous masses, tough and difficult to powder, or in small crystals prepared by crystallisation from Water.

The latter is best for medicinal use.

**Solubility.**— 1 in 3 of Water; 1 in 55 of Rectified Spirit.

**Tests.**—When heated, it volatilises without decomposition, and leaves no residue. Its aqueous solution evolves Ammonia when heated with Solution of Potash, and gives a white precipitate with Nitrate of Silver soluble in Ammonia.

(Austr., Ger., Hung., Russ. and Swiss, Ammonium Chloratum; Dan., Dutch, Norw. and Swed., Chloretum Ammonicum; Fr., Chlorhydrate d'Ammoniaque; Ital., Cloruro di Ammonio; Port., Chloreto de Ammonio; Span., Chloruro Ammonico; U.S., Ammonii Chloridum.)

**Medicinal Properties.**—Expectorant in chronic bronchitis, internally or by inhalation; is a cholagogue and emmenagogue; diaphoretic, diuretic, and alterative in rheumatism; useful in portal dropsy, given in doses of 20 or 30 grs. in half a tumbler of cold water every 4 or 6 hours; in scrofulous and syphilitic enlargement of the glands; useful in hepatitis; said to counteract the tendency to albumenoid degeneration. In facial neuralgia, in doses of 30 grains three times a day, relieves after 4 cr 5 doses, otherwise it is of no use to continue it. As a stimulant and resolvent in bursæ and indolent tumours, also in acne simplex.

*Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.*

**B. P. Dose**, 5 to 20 grains.

10 grains in a claret-glassful (3 oz.) of cold Water, frequently sipped, allays distressing fits of coughing in bronchitis. 10 mins. Sp. Chloroform and 30 mins. of Syrup render it palatable.

The **vapour** is also largely employed in chronic bronchitis; various kinds of inhalers have been introduced for mixing the vapours of Hydrochloric Acid and

Ammonia. In the absence of such an inhaler (or preferably to it), heat a small quantity of the solid in any convenient dish over a spirit lamp and inhale the fumes. In this way there is no possibility of having free Hydrochloric Acid or free Ammonia present in the vapour.

Used in the preparation of Liquor Ammoniæ Fortior and Liquor Hydrargyri Perchloridi.

**Incompatibles.**—Alkalies, Alkaline Earths, and their Carbonates; Lead and Silver Salts.

**Not Official.**

**DRAUGHT.**—Ammonii Chloridi, gr. xv; Tinct. Limon., ♏xlv; Sp. Chloroformi, ♏x; Aquæ, ad ℥iss.

**LOTION.**—1 oz. with 1 oz. Rectified Spirit and 10 oz. Water; Vinegar is sometimes added, to be applied as a dressing for bruises.

**LOZENGES.**—2 or 3 grains in each, are much resorted to for bronchitis.

**Dose.**—2 to 4 lozenges.

## AMMONII CITRATIS LIQUOR FORTIOR.

### STRONG SOLUTION OF CITRATE OF AMMONIUM.

Citrate of Ammonium, $(NH_4)_3C_6H_5O_7$, eq. 243, dissolved in Water.

Strong Solution of Ammonia, 11, or a sufficiency; Citric Acid, 12; Distilled Water, a sufficiency. Neutralise the Acid with the Ammonia, adding sufficient Distilled Water to yield 24 of product. The Solution should be stored in bottles free from Lead.

As commercial Citric Acid may be expected to contain particles of metallic Lead, which are rapidly dissolved in the Citrate Solution, it is better to dissolve the Citric Acid in 8 parts of hot Water and filter through wool before adding the Ammonia.

**Tests.**—Sp. g. 1·209. Neutral to test-papers.

The Solution reacts with Litmus paper far more sharply when diluted with 4 volumes of Distilled Water.

**Dose.**—30 to 90 minims.

(Not in the Foreign Pharmacopœias.)

### Preparation.

**LIQUOR AMMONII CITRATIS.**

Strong Solution of Citrate of Ammonium, 1; Distilled Water, sufficient to produce 4: mix. The Solution should be stored in bottles free from Lead.

**Test.**—Sp. g. 1·062.

**Medicinal Properties.**—Similar to Liquor Ammonii Acetatis.

**Dose.**—2 to 6 fluid drms.; for children $\frac{1}{2}$ to 1 drm.

(Not in the Foreign Pharmacopœias.)

Not Official.

## AMMONII IODIDUM.

### IODIDE OF AMMONIUM.

A whitish deliquescent Salt, granular or in crystals, which readily becomes yellow on exposure to air.

When deeply coloured it is advisable in dispensing to remove the colour by shaking it in a bottle with a lump of Carbonate of Ammonium.

It has been pointed out that the resulting Iodate would be decomposed by the Hydrochloric Acid of the stomach, and result in the re-formation of free Iodine; but as the quantity would generally be very small it may be disregarded.

**Solubility.**—4 in 3 of Water; 1 in 3 of Rectified Spirit; 3 in 4 of Glycerine.

(Fr., Port., Russ., Span., Swiss, and U.S.; not in the others.)

**Medicinal Properties.**—Similar to the Iodide of Potassium, but more active.

**Dose.**—2 to 5 grains three times a day; but much larger doses can be given.

### Preparation.

**UNGUENTUM AMMONII IODIDI.**—Iodide of Ammonium, 120 grains; Lard, 1 oz. Used night and morning.

## AMMONII NITRAS.

### NITRATE OF AMMONIUM.

**$NH_4NO_3$**, eq. 80.

A white deliquescent Salt, in confused crystalline masses, having a bitter acrid taste. Prepared by neutralising diluted Nitric Acid with Solution of Ammonia or Carbonate of Ammonium, evaporating the solution until crystals are obtained, and keeping these fused at a temperature not exceeding 320° F. (160° C.) until the vapour of water is no longer emitted.

It fuses at a temperature of 320° F. (160° C.), and at 350° F. (176·7° C.) to 450° F. (232·2° C.); it is entirely resolved into Nitrous Oxide Gas, **$N_2O$**, and the vapour of water.

When the Nitrous Oxide is to be used for inhalation it should be thoroughly washed with Solution of Sulphate of Iron to remove traces of Nitric compounds, which are always formed during the decomposition.

**Solubility.**—4 in 3 of Water; 1 in 14 of Rectified Spirit.

**Tests.**—A solution of one part in eight parts of Distilled Water gives no precipitate with solution of Nitrate of Silver or of Chloride of Barium—indicating absence of Chlorides and Sulphates.

(Port. and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Chiefly used for preparing Nitrous Oxide Gas (Laughing Gas). This gas is a rapid and safe anæsthetic, extensively used by dentists, and occasionally supplemented with Ether.

Recommended to be used with 12½ per cent. of Oxygen.—*L.* '89, i. 835.

## AMMONII PHOSPHAS.

### PHOSPHATE OF AMMONIUM.

**$(NH_4)_2HPO_4$**, eq. 132.

In colourless transparent prisms, which, upon exposure to air, lose Water and Ammonia, and become opaque.

Obtained by adding Strong Solution of Ammonia to Diluted

Phosphoric Acid, until the solution is slightly alkaline; during the evaporation of this liquid, more Ammonia should be added from time to time to keep it in slight excess, and when crystals are formed on the cooling of the solution, dry them quickly on filtering paper placed on a porous tile, and preserve them in a stoppered bottle.

**Solubility.**—1 in 3 of Water; insoluble in Rectified Spirit.

**Test.**—If 20 grains be dissolved in Water, and Solution of Ammonio-sulphate of Magnesium be added, a crystalline precipitate falls, which, when well washed upon a filter with Solution of Ammonia diluted with an equal volume of Water, dried, and heated to redness, leaves 16·8 grains. The crystalline precipitate is the Ammonio-phosphate of Magnesium, and when this is heated to redness the Ammonia is driven off, and the Pyro-phosphate of Magnesium is left.

(Port. and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Given in gout and rheumatism to render the Urate of Sodium more soluble.

*Is a powerful stimulant of the liver. It does not stimulate the intestinal glands.—Dr. Rutherford.*

**Dose.**—5 to 20 grains 3 or 4 times a day in Water.

Should not be prescribed in too condensed a form when tinctures form part of the mixture, on account of its sparing solubility in spirituous menstrua.

Not Official.

## AMMONII PICRAS.

Pale yellow salt, fairly soluble in Water. Should always be made and kept in the liquid form, as when dry it is powerfully explosive.

Has been strongly recommended in the treatment of malarial fevers in India.—*L.* '87, i. 366.

**Dose.**—$\frac{1}{8}$ to $1\frac{1}{2}$ grains. Average dose, $\frac{1}{2}$ grain four or five times a day.

# AMYGDALA AMARA.

BITTER ALMOND.

The ripe Seed of the Bitter Almond tree, *Prunus amygdalus, var. amara.*

Introduced only as a source of Almond Oil, of which it yields from 42 to 44 per cent., and from which the commercial product is chiefly obtained.

(In all the foreign Pharmacopœias except Dutch; Fr., Amandes Amères; Ital., Mandorle; Port., Amendoas Amargas; Span., Almendro Amargo.)

### OLEUM AMYGDALÆ.

The Oil obtained by pressure from either Bitter or Sweet Almonds.

**Solubility.**—Only slightly soluble in Rectified Spirit, entirely soluble 1 in $2\frac{1}{4}$ of Ether and in all proportions of Chloroform.

Sp. g. ·914 to ·920. It does not congeal until cooled to near —20° C. (—4° F.).

The distinguishing features of Almond Oil are: 1. Elaidin test gives a firm white mass and an almost colourless liquid; 2. The separated fatty Acids never show signs of solidification at or over 15° C., and are soluble in an equal volume of Alcohol at the same temperature.—*Ph. Ger.* '90. *P.J.* xix. 807.

The *Ph. Ger.* '82, Elaidin test, to which exception was taken in "Companion" 1886 and 1890, has been improved by increasing the proportion of Nitric Acid as there suggested.

When 2 c.c. of Almond Oil are thoroughly shaken with a mixture of 1 c.c. Fuming Nitric Acid (sp. g. 1·45—1·5) and 1 c.c. Water, it forms a whitish mixture free from red or brown, and which, after standing some time at about 10° C., separates into a solid white mass and a scarcely coloured fluid.

The Kernels of the Apricot and Peach also yield an Oil much resembling Almond Oil, and known commercially as **Ol. Amygdalæ Persic.**

These Oils may be distinguished from Almond Oil by the reactions described.—*P.J.* xvi. 797.

U.S. (1893) have abandoned the test of its previous editions, the admixture of the Oil with concentrated Sulphuric Acid, commented upon in our previous editions, and have replaced it by the Elaidin test, and the separation of the fatty acids mentioned above, both of which appeared in *P.G.* 1890.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Olio di Mandorle Dolci), Port., Russ., Span. (Aceite de Almendras Dulces), Swed., Swiss and U.S.)

**Medicinal Properties.**—Emollient, demulcent and mildly laxative.

**Dose.**—1 to 4 drms.

1 oz. Oil, with ½ oz. Mucilage, ¼ oz. Sugar, and 6 oz. of Distilled Water, makes a nice cough mixture.

A mixture of equal parts of this Oil and Lime Water, scented with Lemon, is sold for **Glycerine and Lime Juice.**

Used in the preparation of Oleum Phosphoratum, Unguentum Cetacei, Unguentum Resinæ, and Unguentum Simplex. Used in preference to Olive Oil, as it makes a whiter ointment.

### Not Official.

**AQUA AMYGDALÆ AMARÆ.**—Prepared by crushing the bitter almonds and expressing the fixed oil, and then distilling the residual cake with water so that it shall contain the proper quantity of Hydrocyanic Acid ordered in the particular Pharmacopœia.

The following gives the percentage of Hydrocyanic Acid:—

(Austr. (Conc.) ·1 per cent., (Dil.) ·005 p. c.; Dan. (Conc.) ·1 p. c., (Dil.) ·005 p. c.; Ger., Hung., Ital. and Swiss, ·1 p. c.; Norw., ·139 p. c.; Port., not standardised; Russ., ·1 p. c., (Dil.) ·002 p. c.; Span., ·083 p. c.; Swed. (Conc.) ·13—·14 p. c., (Dil.) ·007 p. c.; U. S., not standardised, 1 Volatile Oil in 1000; not in the others.)

**MISTURA AMYGDALÆ AMARÆ.**—Made in the same proportions as Mistura Amygdalæ.

Useful in cough, and as a lotion to allay itching of the skin. It was a favourite vehicle for giving Tartarated Antimony, in doses of ⅛ grain, to subdue inflammatory action of the lungs and relieve cough. The mixture contains a variable amount of Prussic Acid.

**Dose.**—½ to 1½ oz.

**OLEUM AMYGDALÆ AMARÆ ESSENTIALE.**—A volatile oil obtained from Bitter Almonds by macerating with Water the cake from which the fixed oil has been expressed, and subsequent distillation.

A pale yellowish thin liquid, with a characteristic odour.

Sp. g. 1·060—1·070 (after removal of Hydrocyanic Acid 1·045—1·050).

**Solubility.**—Sparingly in water; mixes in all proportions with Rectified Spirit and Ether.

(Belg. and Port., Fr. and U.S.; not in the others.)

Chiefly used as a flavouring agent, when the oil "sine Acido Hydrocyanico" should be employed.

Bitter Almonds contain a Nitrogenous body **Amygdalin**, which under the influence of a ferment **Synaptase** or **Emulsin** (present both in Bitter and Sweet Almonds) is resolved into Glucose and Benzaldehyde-cyanhydrin. During the distillation this latter body is in great part decomposed with formation of Benzaldehyde and Prussic Acid, the former, with the undecomposed Benzaldehyde-cyanhydrin, constituting the Essential Oil, while the Prussic Acid dissolves in the watery portion of the distillate.—*P.J.* xviii. 537.

The proportion of the Cyanogen compound still left in the Oil is equivalent to about 6 per cent. of Anhydrous Prussic Acid, which has to be removed by a special process to form the variety "sine Acid. Prussic" ("S.A.P."), used for culinary flavouring.

The presence of Cyanogen compounds is readily detected by Vortmann's test.—*Y.B.P.* '87, 124. *P.J.* xxiii. 232. *A.J.P.* '91, 43, 300.

An unmistakable reaction can be obtained with $\frac{1}{2}$ c. c. of an Oil (S.A.P.) to which 10 per cent. of Crude Oil has been added.

Essential Oil of Almonds was at one time much liable to adulteration with Nitrobenzol, but this is not now likely to be met with. The common sophistication now is with a synthetic Benzaldehyde prepared from Toluol, which so closely resembles the purified Oil in chemical composition and character as to allow of its wholesale substitution for it. As a flavouring agent it is scarcely inferior, but the absence of the impurities present in the natural Oil causes it to oxidise much more quickly.

Benzaldehyde rapidly absorbs Oxgyen from the air and is converted into Benzoic Acid, causing the Oil to crystallise or even become solid.

The artificial Oil until now has always been characterised by the presence of Chlorine compounds, introduced with the Toluene Chloride from which it is manufactured, which are invariably absent in the natural Oil.

Schimmel's test for these Chlorine compounds is:—Saturate a piece of folded filter paper with the Oil to be examined, and after placing it in a porcelain dish standing in a larger one, ignite it and cover it over with a large inverted beaker, the sides of which have been wetted with Water. The combustion gases become absorbed on the moist sides of the beaker, from which they are washed on to a filter with a little distilled Water, and the filtrate when treated with Solution of Silver Nitrate should give no turbidity, much less a precipitate of Silver Chloride.

Genuine Essential Oil of Bitter Almonds, distilled in the ordinary way from Almonds or Peach Kernels, never gives a chlorine reaction.—*P.J.* xx. 855.

Instead of using a wet beaker, it is a decided improvement to line the beaker with a wet filter paper, taking care of course that this does not contain soluble Chlorides.

**Ol. Amydal. Essent. Persic** is prepared by a similar process to Bitter Almond Oil, from the Kernels of the Apricot and Peach.

## AMYGDALA DULCIS.

### SWEET ALMOND.

The ripe Seed of the Sweet Almond tree, *Prunus amygdalus, var. dulcis,* imported from Malaga, and known as the Jordan Almond.

**Test.**—Not bitter nor evolving the odour of Bitter Almonds when bruised with Water.

(In all the foreign Pharmacopœias except Dutch; Fr., Amandes Douces; Ital., Mandorle; Port., Amendoas Doces; Span., Almendro Dulce.)

**Medicinal Properties.**—Demulcent and nutrient; useful in catarrhal affections. Biscuits are made of Jordan and Valencia Almonds, as a substitute for bread or starchy food for diabetic patients.

### Preparations.

**MISTURA AMYGDALÆ.** *N.O.Syn.*—ALMOND EMULSION.

Compound Powder of Almonds, 1; Distilled Water, 8: rub the Powder with a little of the Water into a thin paste, add the remainder of the Water, and strain through muslin.

A vehicle for cough medicines.

**Dose.**—1 to 2 oz.

(Named **Emulsio** in Austr., Belg., Dan., Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed. and Swiss; U.S. Emulsum A.; there is much variation in the proportions. Not in Dutch.)

**PULVIS AMYGDALÆ COMPOSITUS.**

Sweet Almonds, 8; Refined Sugar, 4; Gum Acacia, 1; both in powder: steep the Almonds in Water until their skins can be easily removed, and when blanched, dry them thoroughly with a soft cloth and rub them lightly in a mortar to a smooth consistence. Mix the sugar and the gum, and, adding them to the almond pulp, gradually rub the whole to a coarse powder. Keep it in a lightly-covered jar.

The rubbing-down process is much facilitated by allowing the blanched almonds to dry, by exposure to air at the ordinary temperature, until brittle.

**Dose.**—60 to 120 grains.

(Not in the other Pharmacopœias.)

## AMYL NITRIS.

### NITRITE OF AMYL.

An ethereal yellowish liquid, consisting chiefly of Nitrite of Amyl, $\mathbf{C_5H_{11}NO_2}$, eq. 117, produced by the action of Nitric or Nitrous Acid on Amylic Alcohol, which volatilises between 262° and 270° F. (or about 128°—132° C.).

It should be stored in hermetically-sealed vessels or in well-stoppered bottles, and in a cool dark place.

Various writers have pointed out the importance of purifying the Amylic Alcohol, until it has a constant boiling point 132° C., previous to using it. Also that the impure Nitrite of Amyl obtained should be washed with Caustic Soda to remove Prussic Acid and other free Acids, and finally rectified over fused Carbonate of Potassium to get rid of the Water, reserving the portion which distils over between 95° and 100° C. (203°—212° F.) for medicinal use.

The various investigations on this subject leave practically no doubt that Nitrous and not Nitric Acid, should alone be used in the process. Arsenious Acid and Nitric Acid sp. g. about 1·35 is a convenient source of the gas, but it is probable that the Dunstan method of preparation from Amylic Alcohol, Nitrite of Sodium, and Sulphuric Acid (Hare's process improved by Dunstan) will supersede that of the B.P. The composition of the product depends largely upon the previous fractionation of the Amylic Alcohol employed, owing to the great difficulty of separating in this way the Iso-butyl Alcohol always associated with the Amylic Alcohol in the crude Fousel Oil.

Should be handled carefully, as even smelling the liquid from a bottle causes violent flushings.

**Solubility.**—Insoluble in Water. Freely soluble in Rectified Spirit, Ether, and Chloroform.

**Tests.**—Sp. g. about ·880. Submitted to distillation, about 70 per cent. passes over at 194° to 212° F. (90°—100° C.), the bulb of the thermometer not dipping below the surface of the residual fluid. If it be added drop by drop to Caustic Potash while fused by the application of heat, Valerianate of Potassium will be formed.

Ger. and U.S. agree that 10 c. c. with 2 c. c. of 1 per cent. Solution of Ammonia ($NH_3$) should not redden Litmus; Ger. it should not blacken Ammonio-Nitrate of Silver (absence of Valeric Aldehyde).

The total Nitrite is conveniently estimated by Allen's Nitrometer as described under Spiritus Ætheris Nitrosi; the number of c. c. of gas evolved multiplied by 5 (4·98) gives the weight in milligrammes of Amyl Nitrite in the quantity operated upon.

(Austr., sp. g. ·902, boils at 95°—98° C.; Belg., sp. g. ·870, boils at 95° C.; Fr., sp. g. ·877, boils at 95° C.; Ger. and Russ., boils at 97°—99° C.; Hung., sp. g. ·900, boils at 96°—99° C.; Ital. (Etere Isoamilnitroso) sp. g. ·9025, boils at 95°—96° C.; Swiss, sp. g. ·870—·900, boils at 99° C.; U.S., sp. g. ·870—·880, boils at 96° to 99° C.)

**Medicinal Properties.**—Anodyne and antispasmodic. Very useful in angina pectoris, asthma, and nervous headache; has been used with advantage in epilepsy and in trifacial neuralgia, also in laryngeal spasm and intestinal colic. A restorative in cases of defective breathing, or the heart's want of power after Chloroform; has been found useful as an antidote to Strychnine.

As Iso-butyl Nitrite has a much more powerful physiological action than a pure Amyl Nitrite, the pure chemical would have a milder action than that of the B.P. but more prolonged. In angina, where a rapid fall of arterial tension is required, the B.P. article is best, but in other cases, such as Bright's disease, when the effect is required to be prolonged, the pure Nitrite is the more effective.

Employed successfully in cases of sea-sickness.—*L.* '79, i. 650, 687, 759.

In the after-pains of labour.—*L.* '87, i. 606.

In traumatic tetanus.—*L.* '87, ii. 1253.

**Dose.**—By **inhalation** the vapour of 2 to 5 minims; but in mixtures to be swallowed, ½ to 1 minim; to be used with caution.

It can be obtained in small **glass tubes** covered with cotton wool.

### Not Official.

**ISO-BUTYL NITRITE.**—For method of preparation and properties see *P.J.* xix. 487.

**TERTIARY AMYL NITRITE** (Bertoni's Ether).—Prepared from tertiary Amylic Alcohol (Amylene Hydrate). It possesses all the properties of the Official Nitrite, but it can be taken in larger quantities without danger, and it does not cause flushing of the face.—*P. J.* xix. 161.

Not Official.

## AMYLENE HYDRATE.

TERTIARY AMYLIC ALCOHOL. DIMETHYLETHYL CARBINOL.

$(CH_3)_2\,C_2H_5,\ COH.$

Prepared by treating Trimethylethylene Amylene with Sulphuric Acid, and subsequent decomposition of the Amylene Sulphate with Alkali.

A clear, colourless, oily liquid with an odour resembling Paraldehyde.

Ger. and Russ. give the sp. g. ·815—·820, and boiling point 99° to 103° C.

A sample examined by us had sp. g. ·812 ; boiled at 212° F. (100° C.) ; crystallised at 5° F.

**Solubility.**—1 in 8 (or rather less) of Water; in all proportions of Rectified Spirit.

**Tests.**—1 c. c. dissolved in 20 c. c. of Water should not within ten minutes either decolourise 2 drops of (1 in 1,000) Solution of Permanganate of Potassium (absence of Ethyl or Amyl Alcohol) or blacken Solution of Nitrate of Silver at 212° F. (absence of Aldehyde).—*Ger.*

(Ger. and Russ., Amylenum Hydratum ; not in the others.)

**Medicinal Properties.**—Hypnotic. Has no unpleasant after-effects, and its taste is less objectionable than that of Paraldehyde.

Produces sleep in all kinds of diseases.

**Dose.**—50 to 70 minims dissolved in Water or Spirit; sometimes given as an enema.

Note.—This must not be confounded with the Hydrate of Amylene described in Watts' Dictionary, i. 208, which is a syrupy liquid, sp. g. ·897, and boils at 177° C. Physiological action not known.

## AMYLUM.

STARCH.

Starch procured from the grains of common wheat, *Triticum sativum* ; maize, *Zea mays ;* and rice, *Oryza sativa.*

In fine powder, or in irregular angular or columnar masses, which are readily reduced to powder ; white, inodorous.

The Brit. Pharm. gives the following microscopical characters :—

1. Wheat Starch : A mixture of large and small granules, which are lenticular in form and marked with faint concentric striæ surrounding a nearly central hilum.

2. Maize Starch : Granules more uniform in size, frequently polygonal, somewhat smaller than the large granules of Wheat Starch, and having a very distinct hilum, but without evident concentric striæ.

3. Rice Starch : Granules extremely minute, nearly uniform in size, polygonal, hilum small and without striæ.

This is the first time that Starches other than Wheat have been recognised in the British Pharmacopœias.

Air-dried Starch always contains 12 to 16 per cent. of moisture ; when dried at 212° F. (100° C.) its composition practically corresponds with the formula $C_6H_{10}O_5$.

**Tests.**—When lightly rubbed in a mortar with a little cold distilled Water, the mixture is neither Acid nor Alkaline to test-paper, and the filtered liquid does not become blue on the addition of Solution of Iodine.

Neutral Starch is seldom obtained ; it is, as a rule, alkaline.

If the granules be rubbed forcibly in a mortar with cold Water, they are broken, and the blue reaction with Iodine takes place, so that in testing as above it is safer to shake in a test-tube.

Mixed with boiling Water and cooled, it gives a deep blue colour with Iodine.

The blue disappears on boiling, but returns on cooling if the boiling has not been too prolonged.

(Austr., Belg., Dan., Ger., Hung., Ital., Norw., Port., Russ., Span. and Swed.; Fr., Amidon: all Wheat Starch; Dutch, Potato Starch; Port. allows several other Starches; Swiss, Rice and Wheat Starch; U.S., Maize Starch.)

**Medicinal Properties.**—A good application to the face and hands when affected by cutaneous eruptions. In the form of Violet Powder, which is merely scented Starch, it is useful to prevent the low inflammation that may be caused by the chafing of the skin of fat infants. Applied also in cases of inflamed veins. It has been given in powder for diarrhœa.

Used in the preparation of Pulvis Tragacanthæ Composita, Suppositoria Acidi Tannici cum Sapone and Suppositoria Morphinæ cum Sapone.

## Preparations.

### GLYCERINUM AMYLI. *N.O.Syn.*—PLASMA.

Starch, 1; Glycerine, 5; Distilled Water, 3; stir them well together in a porcelain dish or other suitable vessel, then heat the mixture gradually to 240° F., constantly stirring until a translucent jelly is formed. (By weight 1 in 8½, by measure 1 in 7½).

The operation should be conducted as quickly as possible, and, to avoid overheating, the use of an oil-bath is to be recommended.

In this formula water has been added with a view to the preparation being less liable to change when kept for some time, but the change which it undergoes on keeping seems to depend more upon the molecular re-arrangement than upon absorption of moisture. In less than two weeks under ordinary conditions it loses its plasticity and adhesiveness, and becomes more of a solid and curdy consistence. When this mass is broken up with a spatula, the liquid which drains out contains Glycerine and Water in the same proportions as in the original finished mass. If re-heated to 240° F. and well stirred, it resumes the plastic condition.

A good application for chilblains and chapped hands.

(Belg., Starch 1, Glycerine 16 (nearly); Dutch, Starch 8, Glycerine 92; Fr. (Glycéré d'Amidon), Starch 1, Glycerine 14; Ital. (Glycerolato di Amido), Starch 7, Water 3, Glycerine 90; Port. (Glycerado Commum), Starch 1, Water 2, Glycerine 17; U.S. (Glyceritum Amyli), Starch 1, Water 1, Glycerine 8. The following are called Unguentum Glycerini: Austr. and Norw., Starch 1, Glycerine 15; Dan., Starch 3, Water 3, Glycerine, 14; Ger., Starch 10, Water 15, Glycerine 100, Tragacanth 2, Alcohol 5; Hung., Tragacanth 1, Alcohol 5, Glycerine 50 (no Starch); Russ., Starch 1, Water 1, Glycerine 14; Span., Starch 1, Glycerine 15; Swed., Starch 2, Water 1, Glycerine 10; Swiss, Starch 7, Glycerine 93; all by weight.)

Used in the preparation of some Suppositoria.

**MUCILAGO AMYLI.**

Starch, 120 grains; Distilled Water, 10 fluid ounces; boil with stirring, for a few minutes. =(1 grain in 40 minims).

Used in **enemas,** either in large quantity, as a vehicle for purgatives, or in small quantity for sedatives or astringents, which are to be retained and absorbed. As an enema *per se,* it is soothing and slightly astringent, and is useful in typhoid fever when the object is rather to regulate than arrest the diarrhœa. It is used extensively to stiffen bandages for fractures, &c.

(Fr. (Lavement avec l'amidon), 1 in 34; Port. (Cozimento de Amido), 1 in 100; Russ. (Decoctum), 1 in 49; not in the others.)

Used in the following Official Enemata: Aloes, Magnesii Sulphatis, Opii and Terebinthinæ.

### Not Official.

**TEST SOLUTION OF STARCH.**—Made with Potato Starch, 1 per cent. is a convenient strength. It can be preserved almost indefinitely, as a sensitive reagent for Iodine, by boiling it in a sterilising flask, and plugging both openings with cotton wool.

A solution of this strength in equal parts of Glycerine and Water, after filtration or decantation from the insoluble cell-envelopes, will keep bright for years.

### Not Official.

## AMYLUM IODATUM.

Iodine, 5; Starch, 95; Distilled Water, q. s. Triturate the Iodine with a little Distilled Water, add the Starch gradually, and continue triturating until the compound assumes a uniform blue colour approaching black. Dry at a temperature not exceeding 40° C. (104° F.) and rub it to a fine powder.

A teaspoonful thrice daily for Lupus Erythematosus.—*B.M.J.* '80, i. 652.

### Preparation.

**PASTA AMYLI IODIDI.**—Starch, 1 oz.; Glycerine, 2 oz.; Water, 6 oz.: boil together, and when nearly cold add Solution of Iodine, B. P., 1 oz.—*Hosp. for Children.*

## ANETHI FRUCTUS.

### DILL FRUIT.

The dried Fruit of the *Peucedanum graveolens.*

An annual, cultivated in Britain or imported from Central and Southern Europe.

(Fr. (Aneth); Port. (Endro); not in the other Pharmacopœias.)

**Medicinal Properties.**—Stimulant, aromatic, and carminative: chiefly given to children in cases of flatulency, or hiccough; and sometimes given with Bicarbonate of Sodium.

### Preparations.

**AQUA ANETHI.**

Bruised Dill Fruit, 1; Water, 20; distil, 10. =(1 in 10).

**Dose.**—$\frac{1}{2}$ to 1 oz.; for children, 60 minims.

(Not in the other Pharmacopœias.)

**OLEUM ANETHI.**

The Oil distilled in Britain from Dill Fruit.

Yield, 2·8 to 3 per cent. Rotation about —50°.

Sp. g.—The samples we have examined varied between sp. g. ·892—·914.

Does not contain Anethol but a terpene (Limonene) with Carvol.

Readily soluble in Alcohol and Ether.

**Dose.**—1 to 4 minims, on Sugar.

(Not in the other Pharmacopœias.)

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Not Official.

## ANILINE.

$C_6H_7N$.

An oily liquid, colourless when freshly distilled, but very prone to become yellow or brown on exposure to air Sp. g. 1·028.

Ital. gives sp. g. (at 16° C.) 1·020, and boiling point 183°—184° C.

**Solubility.**—1 in 27 of Water; 5 in 4 of Proof Spirit; mixes in all proportions with Rectified Spirit, Ether and Glycerine.

**Tests.**—For means of detecting minute traces of Aniline, *see Y.B.P.* '77, 80.

**Medicinal Properties.**—Has been used in phthisis by Prof. Kremianski: his treatment is, meal powder as nourishment *per os* or *per anum*, Antifebrin to reduce pyrexia, and inhalations of Aniline. A **solution** 1 of Aniline in 7 of Oil of Eucalyptus or Aniseed, or a **mixture** of Aniline 1, Oil of Peppermint 2, Distilled Water 8; which latter was used when the first did not suit the patient.—*B.M.J.* '87, i. 579, *L.* '88, i. 569.

Aniline recommended to be used with a Siegle's Spray.—*L.M.R.* '88, 24.

The treatment reported on unfavourably by a medical committee.—*B.M.J.* '87, i. 789, 842.

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# ANISI FRUCTUS.

ANISE FRUIT.

The dried fruit of *Pimpinella Anisum.*

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

**Medicinal Properties.**—Stimulant, aromatic, and carminative, slightly expectorant; used to relieve flatulence, and to diminish the griping of purgative medicines.

### Preparations.

**AQUA ANISI.**

Bruised Anise Fruit, 1; Water, 20; distil, 10. =(1 in 10).

(Belg., from Oil and Alcohol; Fr., Port. and Span., from Fruits, Russ. and U.S. from Oil; not in the other Pharmacopœias.)

**Dose.**—½ to 1 oz.

**OLEUM ANISI.**—*See* ANISI OLEUM.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

# ANISI STELLATI FRUCTUS.

STAR-ANISE FRUIT.

The dried Fruit of *Illicium Anisatum*, from plants cultivated in China.

(Austr., Belg., Dan., Fr. (Badiane), Hung., Ital., Port. (Aniz Estrellado), Russ., Span., Swed., Swiss and U.S.; not in Dutch, Ger. or Norw.)

### Preparation.

**OLEUM ANISI.**—*See* ANISI OLEUM.

(Belg. and Port.; not in the other Pharmacopœias.)

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# ANISI OLEUM.

OIL OF ANISE.

The Oil distilled in Europe from Anise Fruit, or in China from Star Anise Fruit.

Colourless, or a very pale yellow. The ordinary Oil of Anise congeals at temperatures between 50° and 60° F. (10° to 15·5° C.), and may remain solid at 62° or 63° F. (16·7° to 17·2° C.); Oil of Star-Anise only becomes solid at a few degrees above the freezing point of Water.

Both Oils of Anise consist mainly of a stearoptene "Anethol," with a smaller proportion of Terpene. The Pimpinella Oil is readily distinguished from that of Star Anise by giving a deep blue colour on the addition of *saturated* solution of Hydrochloric Acid Gas in Alcohol.

Owing to the oxidation of Anethol to Anisic Aldehyde by exposure to air, the characters of the Oil are greatly changed. Rise of sp. g. and lowering of melting point are the principal indications as to the extent of oxidation. These changes will be found discussed in detail, in our paper, *P.J.*, xxiv. 104.

A freshly distilled Oil may be expected to have a **specific gravity** between ·975 and ·990, and a **melting point** between 60° and 68° F.

The bulk of Anise Oil in England is stated to be obtained from *Illicium anisatum*; but on the Continent the Pimpinella Oil is that principally used, and it is Official in all the Pharmacopœias compared in this work; the Illicium is Official in but two of them, Belg. and Port.

**Solubility.**—1 of Pimpinella Oil in 3 of Rectified Spirit; 1 of Illicium Oil in 4 of Rectified Spirit (a slight rise in temperature greatly increases the solubility in Rectified Spirit); both oils dissolve in all proportions of Absolute Alcohol; 1 of Pimpinella Oil in 200 of Proof Spirit, at which point the Illicium Oil is distinctly turbid.

These variations in solubility seem to arise from the presence in the Illicium Oil of a small proportion of a much less soluble Oil, which is absent in the Pimpinella.

(Belg., sp. g. ·972—·995; Austr., Dan., Dutch, Ger., Russ., Swiss and U.S., sp. g. ·980—·990; Hung., sp.g. ·978—·984; Port., sp. g. ·977—·983; the others do not give sp. g.)

(For full list of Pharmacopœias and source of Oil, *see* under Fructus.)

**Dose.**—1 to 4 minims, on sugar.

Contained in Tinctura Camphoræ Comp. and Tinctura Opii Ammoniata.

### Preparation.

**ESSENTIA ANISI.**

Oil of Anise, 1; Rectified Spirit, 4; mix. =(1 in 5).

**Dose.**—10 to 20 minims.

(Belg., 1 Oil in 100; Fr., 1 Oil in 50; U.S. Spiritus, 1 Oil in 10; Austr., 1 of fruits in 6; Span., 1 of fruits in 6 (distilled); all by weight except U.S. not in the others.)

### Not Official.

**TINCTURA ANISI** (Fr. and Russ.)—Anise Fruit, 1; Rectified Spirit, 5.

**ANISIC ACID** ($H.C_8H_7O_3$).—It occurs in shining acicular crystals obtained by the oxidation of Oil of Anise or Anethol.

**Solubility.**—Almost insoluble in cold Water, 1 in 700 boiling Water; 1 in 36 of Rectified Spirit; 1 in 50 of Ether.

**ANISATE OF SODIUM.**—In rhombic crystals, frequently efflorescent, with a slight aromatic odour.

**Solubility.**—1 in 5 of Water; 1 in 6 of Proof Spirit; 1 in 24 of Rectified Spirit.

Anisic Acid and its Sodium Salt have been stated to possess antiseptic and antipyretic properties, similar to Salicylic Acid.

**ANETHOL** ($C_{10}H_{12}O$).—The Stearoptene separated from either of the Anise Oils. It is said to have a finer flavour than the Oil, being free from the acridity pertaining to the non-freezing portion of the Oil. Sp. g. ·985 at 25° C.; melting point 21°—22° C. (70° F.); boiling point 234° C.

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## ANTHEMIDIS FLORES.

### CHAMOMILE FLOWERS.

The dried Flower-heads of *Anthemis nobilis*, single and double, from cultivated plants.

Both varieties, but especially the single, have a strong aromatic odour and very bitter taste.

The "German" Chamomile (*Matricaria Chamomilla*) is scarcely if at all bitter.

(Austr., Belg., Dan., Dutch, Fr., Ital., Port., Span. (Manzanilla), Swiss, and U.S.; not in the others; also Matricaria in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Russ., Span. (Manzanilla Comun), Swed., Swiss, and U.S.)

**Medicinal Properties.**—Tonic, aromatic, and stomachic. In large doses, emetic. The infusion taken early every morning is useful in atonic dyspepsia, and externally as a fomentation for bruises and inflammation.

### Preparations.

**EXTRACTUM ANTHEMIDIS.**

Chamomile Flowers, 16 oz.; Oil of Chamomile, 15 minims; Distilled Water, a gallon; boil the flowers in the Water till the volume is reduced to one-half, then strain, press, and filter; evaporate the filtered liquor by a water bath to a pill consistence, adding the Oil of Chamomile at the end of the process.

The double flowers yield about 30 per cent. of Extract.

**Dose.**—2 to 10 grains.

(Belg., from Anthemis; Fr., from both; Dan. and Swed., from Matricaria; not in the others.)

### INFUSUM ANTHEMIDIS.

Chamomile Flowers, ½; boiling distilled Water, 10; infuse for fifteen minutes in a covered vessel, and strain. =(1 in 20).

**Dose.**—As a stomachic, 1 to 4 oz.; as an emetic, 5 to 10 oz.

(Fr. (Tisane) 1 in 200; Span. 1 in 69; not in the others.)

### OLEUM ANTHEMIDIS.

Distilled in Britain from the flowers.

Pale blue or greenish blue, gradually becoming yellowish brown by keeping.

A mixture of Ethers, principally Angelate and Valerianate of Butyl and Amyl. Sp. g. ·905—·915.

**Solubility.**—Sparingly in Water; 10 in 3 of Rectified Spirit; 1 in 40 Proof Spirit, forms an opalescent solution.

**Dose.**—1 to 4 minims.

(Span., from Anthemis; Fr., from Anthemis and Matricaria; Belg. and Swiss, from Matricaria; Ital., from Matricaria; not in the others.)

Stimulant and carminative. Prescribed in pills with Rhubarb or other powder.

#### Not Official.

**AQUA ANTHEMIDIS.**—Flowers 1; Water 20; distil 10. =(1 in 10).

(Austr. and Dan., 1 in 10; Dan. also Conc., 1 in 1; Belg., 1 in 5; Fr., Port. and Span., 1 in 4; Swed., 1 in 7; all distilled. Belg., Port. and Span., from Anthemis; Austr., Dan., Dutch and Swed., from Matricaria; Fr. from both.)

**OLEUM CHAMOMILLÆ INFUSUM.**—Chamomile Flowers 1; Olive Oil 10; digest in a water-bath for 2 hours, strain, press, and filter.

(Fr. and Port., 1 in 10; Span., 1 in 8; from Anthemis. Belg., 1 in 10; Ital., 1 in 4; Norw., 1 in 5, from Matricaria.)

**TINCTURA ANTHEMIDIS.**—Single Chamomiles carefully dried, 1; sufficient Rectified Spirit to percolate 8: or an equivalent quantity of fresh flowers (about 3), and macerate with 8 of Rectified Spirit for 7 days, and press.

The moisture in the fresh flowers reduces the strength of the spirit so that less resin is dissolved, and the tincture is consequently less bitter.

## ANTIFEBRIN.

*See* ACETANILIDUM.

#### Not Official.

## ANTIMONIUM.

ANTIMONY.

Sb, eq. 120.

In older Pharmacopœias and works on Chemistry the combining weight of Antimony was given as 122.

Of a silvery-white colour, brittle and crystalline. Sp. g. 6·7.

This metal rarely occurs native, but generally as the black Sulphuret (Sulphide), the Stibium of the ancients. It was first made known in the metallic state by Basil

Valentine towards the end of the fifteenth century. It is prepared on a large scale by roasting the Sulphuret (mixed with Charcoal to prevent caking) until it is converted into Oxide, which is then reduced by means of Charcoal and Carbonate of Potassium. It is extensively employed in the manufacture of type-metal and the alloy known as Britannia metal. It melts at about 800° F., and as the ingots cool, its surface has a beautiful stellated appearance: the alchemist considered this star as a mysterious guide to the secrets of transmutation. It is volatile at a white heat.

The most characteristic reactions of Antimony are:—(1) The orange-red Sulphide precipitated with Sulphuretted Hydrogen; (2) Metallic coating on copper with Reinsch's test, from which no sublimate can be obtained. (3) Formation of Antimoniuretted Hydrogen from Zinc and Acid, the spots on cold porcelain being unaffected by Hypochlorite Solution. (4) Non-formation of Antimoniuretted Hydrogen with Zinc and Caustic Alkali.

(Span.; not in the other Pharmacopœias.)

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## ANTIMONII CHLORIDI LIQUOR.

### SOLUTION OF CHLORIDE OF ANTIMONY.

Chloride of Antimony, $SbCl_3$, eq. 226·5, dissolved in Hydrochloric Acid. It contains 36·7 per cent. of $SbCl_3$.

A yellowish-red liquor; prepared by boiling Purified Black Antimony in Hydrochloric Acid; introduced chiefly for the purpose of preparing the Oxide of Antimony.

**Tests.**—Sp. g. about 1·47. 1 fluid drm., mixed with a solution of ¼ oz. of Tartaric Acid in 4 oz. of Water, forms a clear solution, which, if treated with Sulphuretted Hydrogen, gives an orange precipitate, weighing, when washed and dried at 212° F. (100° C.), at least 22 grs.

(Fr. and Port. a crystalline mass; Belg., sp. g. 1·40—1·44; Dan., sp. g. 1·44—1.45; Port., saturated, sp. g. not given; Span.; Swiss, sp. g. 1·34—1·36; not in the others.)

**Medicinal Properties.**—A caustic; it usually acts without causing much pain or inflammation, and after the separation of the eschar, forms a clean, healthy ulcer. Sometimes applied to cancerous growths and poisoned wounds. Never used internally.

**Antidotes.**—Magnesia, Carbonate of Sodium.

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## ANTIMONII OXIDUM.

### OXIDE OF ANTIMONY.

$Sb_2O_3$, eq. 288.

A greyish-white powder, fusible at a low red heat.

Prepared by diluting Solution of Chloride of Antimony with a large excess of Water, and decomposing the precipitated Oxychloride (after washing) with Solution of Carbonate of Sodium.

**Solubility.**—Insoluble in Water, Alcohol, and Nitric Acid; readily soluble in Hydrochloric Acid and warm solution of Tartaric Acid.

**Tests.**—Dissolves entirely when boiled with an excess of Acid Tartrate of Potassium—indicating absence of other oxides of Antimony. The solution in Hydrochloric Acid, when mixed with Distilled Water, forms a white precipitate, which is changed to orange by Sulphuretted Hydrogen.

If 1 grm. of Oxide of Antimony be dissolved with the aid of 5 grm. of Tartaric Acid in a little water, and the solution be diluted with Water to measure 100 c.c., portions of this solution should not be affected by test-solutions of Nitrate of Silver (Chloride), Chloride of Barium (Sulphate), or Ferrocyanide of Potassium (Iron and other metals).—*U.S.P.*

(Belg., Port., Span. and U.S.; not in the others.)

**Medicinal Properties.**—Diaphoretic. Less active than the Tartrate. Emetic in large doses.

**Dose.**—1 to 4 grs. in a pill.

Used in the preparation of Antimonium Tartaratum.

### Preparation.

**PULVIS ANTIMONIALIS.**

Oxide of Antimony, 1; Phosphate of Calcium, 2; mix. =(1 in 3).

**Dose.**—3 to 5 grs.

(Belg., Oxide of Antimony 334, Phosphate of Lime 666; Port., Oxide of Antimony 35, Phosphate of Lime 65; U.S., Oxide of Antimony 33, Precipitated Phosphate of Calcium 67; not in the others.)

The following analysis was made by Robert Scott, of Dublin, of a very old packet of **James's Fever Powder** (bearing Messrs. Newbery's name) for the British Pharmacopœia Committee:—

| | | |
|---|---|---|
| Soluble in Water— | Antimonite of Lime | ·095 |
| | Sulphate of Lime | ·267 |
| | Alkaline Salts | ·220 |
| Insoluble in Water— | Antimonious Acid | 33·216 |
| | Teroxide of Antimony | ·601 |
| | Phosphate of Lime | 62·124 |
| | Lime | 1·954 |
| | Residue | 1·603 |
| | Loss | ·502 |
| | | 100·000 |

## ANTIMONIUM NIGRUM PURIFICATUM.

PURIFIED BLACK ANTIMONY.

*N.O.Syn.*—Prepared Sulphuret of Antimony.

Native Sulphide of Antimony, $Sb_2S_3$, eq. 336, purified from Siliceous matter by fusion, and reduced to fine powder, and if any soluble salt of Arsenium be present, must be repurified with solution of Ammonia.

Any Arsenical impurity is likely to exist as Sulphide of Arsenic ($As_2S_3$), which can scarcely be called a "soluble salt."

**Tests.**—Dissolves almost entirely in boiling Hydrochloric Acid, evolving Sulphuretted Hydrogen, and the solution affords a white precipitate when poured into Water. If one grain be dissolved in Hydrochloric Acid, and the solution slightly diluted be gently warmed with a piece of bright copper foil, the copper being washed, dried, and heated in a dry narrow test-tube, no crystalline sublimate (of Arsenious Anhydride) should form on the upper cool part of the tube.

As the test given does not appear to be satisfactory, 1 per cent. of Arsenious Sulphide escaping detection, it is recommended to substitute Fleitmann's test with Zinc and Caustic Soda.—*P.J.* xvi. 433.

(Austr. (Crude); Belg., Dan., Fr., Ger., Ital., Norw., Port., Russ., Swed., Swiss and U.S.; not in the others.)

Used to prepare Antimonium Sulphuratum and Liquor Antimonii Chloridi.

## ANTIMONIUM SULPHURATUM.

### SULPHURATED ANTIMONY.

*N.O.Syn.*—ANTIMONII OXYSULPHURETUM; ANTIMONII SULPHURETUM AUREUM; ANTIMONII SULPHURETUM PRÆCIPITATUM.

A mixture containing Sulphide of Antimony, $Sb_2S_5$, and Oxide of Antimony, $Sb_2O_3$; prepared by dissolving Purified Black Antimony and Sublimed Sulphur in Solution of Soda, diluting with Water and precipitating from the strained liquid by the addition of Sulphuric Acid.

The $Sb_2S_5$ mentioned in B.P. formula is more probably $Sb_2S_3$ with a variable proportion of free Sulphur; 3 commercial samples yielded to Bisulphide of Carbon 20, 31, and 40 per cent., while a specimen prepared by the B.P. process yielded 12 per cent. of Sulphur. The proportion of Oxide present was found to be 2 to 3 per cent. in the commercial samples, but only ·2 per cent. in that prepared according to the B.P.

A bright orange or golden-red powder, without odour and with a slight taste.

**Solubility.**—Insoluble in Water; dissolves readily in Caustic Soda, also in hot Hydrochloric Acid.

**Test.**—60 grains moistened and warmed with successive portions of Nitric Acid until red fumes cease to be evolved, and then dried and heated to redness, gives a white residue weighing about 40 grains.

If 1 grm. of Sulphurated Antimony be shaken with 20 c.c. of hot Water, the filtrate should be neutral to test paper; should not be rendered more than slightly opalescent by test solution of Chloride of Barium (limit of Sulphate), or of Silver Nitrate (limit of Chloride), and should not be affected by test solution of Ammonium Oxalate (absence of Calcium).—*U.S.P.*

(U.S., Antimonium Sulphuratum; Austr., Belg., Hung., Russ. and Swiss, Stibium Sulphuratum Aurantiacum; Dan., Dutch, Norw., and Swed., Sulphidum Stibicum; Fr., Soufre Doré d'Antimoine; Ger., Stibium Sulfuratum Aurantiacum; Port., Enxofre Dourado de Antimonio; Span., Sulfuro Antimonico Sulfurado.)

**Medicinal Properties.**—Alterative, diaphoretic, and emetic; uncertain in action from its slight solubility, depending on the acidity of the stomach. Usually prescribed with Calomel and Guaiacum, as in Pilula Hydrargyri Subchloridi Composita, for secondary syphilis and cutaneous eruptions; or with Henbane or Hemlock in chronic rheumatism.

It is largely used for vulcanising red india-rubber, and on a manufacturing scale the Soda of the B.P. process is replaced by Lime.

**Dose.**—1 to 5 grs. in pill.

Contained in Pilula Hydrargyri Subchloridi Composita.

**KERMES MINERAL.**—This is still occasionally prescribed and is Official in Belg., Dan., Fr., Hung., Ital., Norw., Port., Span., Swed., Swiss and U.S.

## ANTIMONIUM TARTARATUM.

### TARTARATED ANTIMONY.

*B.P.Syn.*—ANTIMONII POTASSIO-TARTRAS; TARTAR EMETIC.

An Oxytartrate of Antimony and Potassium $(KSbOC_4H_4O_6)_2H_2O$, eq. 664; prepared by dissolving Oxide of Antimony in Acid Tartrate of Potassium. In colourless crystals, exhibiting triangular facets.

The crystals are liable to loss of Water by efflorescence. To obviate this variation Dunstan has proposed to use the Anhydrous Salt, prepared by precipitating a strong Aqueous Solution of Tartar Emetic with a large excess of Methylated Spirit, the precipitate collected by decantation or filtration, washed with Methylated Spirit, and quickly dried over a water-bath. 1 of the Anhydrous Salt dissolves in 14·53 of Water.

**Solubility.**—1 in 15 of cold Water (slowly); 1 in 2 of Boiling Water; sparingly soluble in Proof Spirit; insoluble in Rectified Spirit.

**Tests.**—Its solution in Water gives with Hydrochloric Acid a white precipitate, soluble in excess, which is not formed if Tartaric Acid be previously added. 29 grs. (after some time) dissolve without residue in a fluid ounce of Distilled Water at 60° F. (15·5° C.), and the solution gives with Sulphuretted Hydrogen an orange precipitate which, when washed and dried at 212° F. (100° C.), weighs 15·1 grs. (Golden Sulphuret of Antimony.)

Dunstan points out that although the theoretical weight of Sulphide precipitated is only 14·67 grains, the above process is liable to such errors, that the weight of the precipitate is likely to be several grains more. He proposes the following:—Dissolve ·3 gramme of Tartar Emetic in 80 c. c. of Water, add to this 10 c. c. of a 5 p. c. solution of Bicarbonate of Sodium, and immediately titrate with $\frac{N}{10}$ solution of Iodine, using Starch solution as an indicator. The Alkali must be added not long before the titration, or the Antimony will be precipitated.—*P. J.* xix. 385.

1 c. c. $\frac{N}{10}$ solution of Iodine = ·0166 gramme Tartar Emetic, therefore the quantity required for ·3 gramme will be 18 c.c.

Conversely Iodine may be estimated with standard Tartar Emetic.—*P.J.* xix. 582.

(Austr., Stibium Kalio-Tartaricum; Belg., Tartras Antimonico Potassicus; Dan., Norw. and Swed., Tartras Stibico-Kalicus; Dutch, Tartras Kalico-Stibicus; Fr., Tartrate d'Antimoine et de Potasse; Ger. and Swiss, Tartarus Stibiatus; Hung., Kalium Stibio-Tartaricum; Ital., Tartrato di Antimonio e di Potasio; Port., Tartrato de Potassa e de Antimonio; Russ., Stibio-Kalium Tartaricum; Span., Tartrato Antimonico Potasico; U.S., Antimonii et Potassii Tartras.)

**Medicinal Properties.**—Diaphoretic, expectorant, and emetic. In continued small doses it relaxes, and causes increased secretion from the mucous membranes and skin, and is a *depressant* to the whole vascular system.

As a febrifuge, it is given with great effect in acute pneumonia and bronchitis, and for reducing inflammation generally.

Externally, in the form of ointment, it acts as a powerful counter-irritant to the skin, producing a pustular eruption.

**Dose.**—As a diaphoretic, $\frac{1}{16}$ to $\frac{1}{6}$ gr.; as a depressant, $\frac{1}{6}$ to 1 gr.; as an emetic, 1 to 2 grs. Best prescribed in aqueous solution or as the Vinum.

**Incompatibles.**—Gallic and Tannic Acids, the Alkalies and their Carbonates, and Lead Salts. Astringent infusions, as Cinchona, Rhubarb, &c.

**Antidotes.**—Tannic or Gallic Acid, Catechu, vegetable astringents, Tea or Coffee, stimulants if much collapse.

### Preparations.

**UNGUENTUM ANTIMONII TARTARATI.**

Tartarated Antimony in fine powder 1; Simple Ointment, 4; mix. =(1 in 5).

(Hung. (Ung. Autenriethi), 1 in 5; Ung. Tartari Stibiati, Belg., 1 in 6·6, Ger. and Swiss, 1 in 5; Dutch (Ung. Tartratis Kalico-Stibici), 1 in 5; Fr. (Pommade Stibiée), 1 in 4; Norw. (Ung. Stibiatum), 1 in 5; Port. and Span. (Pomada Estibiada), 1 in 4; Russ. (Ung. Stibio-Kalii Tartarici), 1 in 5; not in the others.)

**VINUM ANTIMONIALE.**

Tartarated Antimony, 40 grs.; Sherry, 20 oz.: dissolve, and filter if necessary. =(1 in 219).

*Note.*—The Tartarated Antimony does not dissolve in the Sherry readily; it is better to dissolve it in about ten times its weight of hot Water, and then add the Wine. Each fluid drachm contains $\frac{1}{4}$ grain.

**Dose.**—5 to 60 minims.

(Vinum Stibiatum, Dutch, Ger., and Norw., 1 in 250; Ital. (Vino Antimoniale di Huxham), 1 in 250; Span. (Vino de Tartrato Antimonico Potasico), 1 in 230; Russ. (Vinum Stibio-Kalii Tartarici), 1 in 250; U.S., (Vinum Antimonii), 1 in 250; all with Sherry. Austr. (Vinum Stibii Kalio-Tartarici), 1 in 250; Hung. (Vinum Stibiato-Tartaricum), 1 in 240; Belg., (Vinum Antimoniatum), 1 in 200; Vinum Stibiatum, Swed. and Swiss, 1 in 250; all with Malaga Wine. Port. (Vinho Antimonial), 1 in 200 of Port Wine. All by weight, except U.S. Not in Fr.)

## ANTIPYRIN.

*See* PHENAZONUM.

### Not Official.

## APIOL.

A greenish-brown oily liquid, obtained from the fruits of *Apium petroselinum* (Parsley), with a peculiar odour and disagreeable taste.

From the published papers of MM. Joret and Homolle, the introducers of this medicine, it would appear (*P.J.* [2], iv. 269) that originally (1850-55) the non-volatile oil alone was used, and to which the name Apiol was alone applied; but from an examination of capsules obtained from them in 1889, we find the *volatile* oil is now employed, 95 per cent. of the liquid being carried over by distillation with Water.

(Belg. and Port., Apiol; Dan. and Norw., Ætheroleum Petroselini.)

It is useful in amenorrhœa and dysmenorrhœa.—*L.* '85, i. 59; *T.G.* '86, 239.

### Not Official.

## APOCYNUM U.S.

### CANADIAN HEMP.

The root of *Apocynum Cannabinum* is Official in U.S.P.

It has been used in the United States as a **Decoction,** 1 Root in 60 of Water, boil to 40 (dose ½ to 1 oz.), and given with good effect as a diuretic in dropsy.—*L.* '85, ii. 86; '86, i. 508; *B.M.J.* '87, i. 522.

Also as a **fluid extract** (dose 5 to 15 minims) in pleurisy with effusion.—*T.G.* '87, 29.

It also possesses emetic and cathartic properties; but as it is a drastic purgative, it should be given with some caution.

### Preparations.

**EXTRACTUM APOCYNI FLUIDUM** (*U.S.*).—1 fluid oz. equals 1 oz. of root.

**TINCTURA APOCYNI.**—Root, 1; Proof Spirit, 10.

**Dose.**—5 to 10 minims, as a cardiac tonic, and diuretic in cardiac dropsy.—*T.G.* '89, 585.

## APOMORPHINÆ HYDROCHLORAS.

### HYDROCHLORATE OF APOMORPHINE.

$C_{17}H_{17}NO_2$, HCl, eq. 303·5.

The Hydrochlorate of an alkaloid obtained by heating Morphine or Codeine in sealed tubes with Hydrochloric Acid.

Small greyish white shining acicular crystals, turning green on exposure to light and air, with a very faint acid reaction on moistened Litmus paper.

NOTE.—It should be kept in small well-stoppered vials in a dark place.

**Solubility.**—1 in 50 of Rectified Spirit; nearly insoluble in Chloroform and in Ether.

In the *C.D.*, '90, i. 488, the question was raised as to what is the true solubility in Water of Apomorphine Hydrochlorate.

In Martindale's Extra Pharmacopœia, '83, the solubility was given at 1 in 7, changed in '84 to 1 in 35. The original error was copied into B.P. '85, but corrected in the later reprints to 1 in 50 presumably from the experiments of Dott (*P.J.* xvi. 300).

We have been Officially informed that the *U.S.P.* 1882, intended to give the solubility as 1 in 68, but owing to a misprint, it appears as 1 in 6·8.

As Companion 1886 and 1890 gave 1 in 70, a series of experiments were made with the view of ascertaining how such an apparently erroneous figure had been obtained, and the results afford a typical example of the manner in which solubilities may vary according to the method by which they are taken.

The material used was re-crystallised, air-dried and powdered. It lost 3 per cent. of hygroscopic moisture on heating in a water-bath, which was exactly regained after 12 hours exposure to air. The methods and results were as follows:—

(1) Minimum quantity of Water required for complete solution in 3 days at 60° F. Between 1 in 56 and 1 in 60.
(2) Evaporation of solution digested over excess of Salt for 2 days at 60° F. Result 1 in 56.
(3) Dissolved by heat, 1 in 36 generally crystallised within 24 hours, the length of time increasing with the degree of dilution, till at 1 in 45 no crystallisation was visible after some weeks.
(4) Evaporation of saturated solution from which crystals have separated after 24 hours at 60° F. yielded 1 in 43, but after 48 hours 1 in 49.

The practical inference is that if the Official Injectio Apomorphinæ Hypodermica, 2 grains in 100 minims, be prepared at the ordinary temperature, and filtered as directed, the solution should not be expected to contain more than $\frac{3}{4}$ of the quantity of the salt used; but if completely dissolved by warming there is no danger of crystallisation at temperatures over 60° F.

Its aqueous solution on being gently warmed rapidly turns green, more particularly if rendered faintly alkaline with Carbonate of Potassium.

**Tests.**—Solution of Bicarbonate of Sodium added to an aqueous solution of the Salt throws down the white amorphous alkaloid, which becomes green on standing, and forms a bluish-green solution with Alcohol, a purple one with Ether or pure Benzol, and violet with Chloroform; with dilute solution of Perchloride of Iron it gives a deep red, and with Nitric Acid a blood-red coloration.

(Austr., Dutch, Ger., Hung., Russ., Swiss and U.S.; Fr., Apomorphine; not in the others.)

**Medicinal Properties.**—It is a powerful emetic, and usually acts promptly without the production of much preceding nausea or depression. It is therefore useful as a **hypodermic injection** in cases of poisoning; usual dose $\frac{1}{10}$th grain = 5 minims of the injection.

Has been used in bronchial catarrh, *L.M.R.* '81, 148; as an expectorant for children and adults, given with Hydrochloric Acid and Syrup, *L.M.R.* '82, 497; a sedative in nervous affections, *L.* '84, ii. 1166; in croup and bronchitis, *B.M.J.* '85, ii. 748; in coughs, *L.* '87, ii. 497; $\frac{1}{60}$ to $\frac{1}{40}$ grain given as an expectorant to children in capillary bronchitis and croup, *T.G.* '87, 657; as an emetic, *B.M.J.* '89, i. 339, 394, 885.

P.G. maximum single dose $\frac{1}{7}$ grain; maximum daily dose $\frac{3}{4}$ grain.

### Preparation.

### INJECTIO APOMORPHINÆ HYPODERMICA.

Hydrochlorate of Apomorphine, 2 grs.; Camphor Water, 100 mins.: dissolve and filter. The solution should be made as required for use.

This will not dissolve at 60° F., but there is no objection to warming the fluid. The Salt will not crystallise out again at that temperature, and the development of the green colour in no way impairs its efficacy. A solution 2 years old has proved as effective as one freshly made.

*B.P. Dose, by subcutaneous injection.*—2 to 8 minims (= $\frac{1}{25}$ — $\frac{1}{6}$th grain).

Not Official.

**SYRUPUS APOMORPHINÆ HYDROCHLORATIS** (*B.P.C.*).—Hydrochlorate of Apomorphine, 5 grains; Diluted Hydrochloric Acid, 2 fl. drs.; Rectified Spirit, 7 fl. drs.; Distilled Water, 7 fl. drs.; Syrup, 18 fl. oz.; dissolve the Salt in the Spirit and Water mixed, then add the Acid and the Syrup.

**Dose.**—$\frac{1}{2}$ to 1 fluid drachm.

# AQUA.

## WATER.*

The Pharmacopœia orders the purest natural Water that can be obtained, cleared, if necessary, by filtration, free from odour, unusual taste, and visible impurity, to be used whenever "Water" is ordered in the British Pharmacopœia. In dispensing prescriptions, Aqua should be understood to mean Distilled Water.

Water obtained in different localities varies much in respect to its purity, and the earthy and saline matters *actually dissolved* in it cannot be separated by filtration alone.

The purest Water is from the Wenham Lake ice and the Norwegian ice. After these may be taken Distilled Water and snow-water. Rain-water contains about a millionth part of Ammonia, and probably about the same amount of Chloride of Sodium. The following table will show how great a difference exists in the quantity of Lime and saline matters dissolved in various natural waters :—

| | | | | | |
|---|---|---|---|---|---|
| Loch Katrine, | supplying | Glasgow, | contains | 2 grs. | in the gallon. |
| River Dee | ,, | Aberdeen | ,, | 4 | ,, |
| ,, Tay | ,, | Perth | ,, | 5 | ,, |
| Water supplied to Liverpool | | | ,, | 5 | ,, |
| Claremont Water | | | ,, | 5·7 | ,, |
| Farnham, in Surrey | | | ,, | 7·25 | ,, |
| Thames, supplying London | | | ,, | 19 to 22 | ,, according to locality. |
| Water supplied to Watford | | | ,, | 22·75 | ,, |
| Spring Water | | | ,, | 40 to 60 | ,, |

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* One cannot resist expressing a few thoughts on this all-important fluid, without which all animal and vegetable life must cease. Water exists in the liquid, solid and gaseous states, and on one or other of these we mainly depend for our mechanical power and our mode of travelling by sea and by rail. Its beauty is shown in the clouds, the rainbow, the dew, hoar-frost, crystals of snow, and the glaciers. Water is endowed with the remarkable property of being at its greatest density at the temperature of 39·5° F., so that ice at 32° F. floats upon it, and aquatic life is preserved in the coldest winter.

Twenty-five measured ounces at 212° become 24 at 60° F., and $23\frac{3}{4}$ at 39·5° F., its greatest density.

The pressure of the atmosphere will support 36 feet of Water, and a Water Barometer was erected in the Royal Society's House, by Professor Daniel, and 3000 hourly observations were made, comparing it with the Standard and the Mountain Barometers, and it was found uniformly to be an hour in precession of them in the changes.—R. S. Trans. 1832.

A Glycerine Barometer is now in use at Printing House Square, and the markings are reported in the *Times*, 323 inches of the Glycerine Barometer being equal to 30·35 inches of the Mercurial Barometer.

| | | | |
|---|---|---|---|
| River Jordan | contains | 75 | grs. in the gallon. |
| ,, after 3 weeks' rain | ,, | 65 | ,, |
| Sea-water, shores of the Baltic | ,, | 1100 | ,, |
| ,, Firth of Forth | ,, | 2100 | ,, |
| ,, off Boulogne | ,, | 2240 | ,, |
| ,, German Ocean | ,, | 2380 | ,, |
| ,, open Atlantic, Canaries | ,, | 2450 | ,, |
| ,, English Channel, near Havre | | 2520 | ,, |
| ,, Bay of Biscay, Bayonne | ,, | 2660 | ,, |
| ,, Mediterranean, Marseilles | ,, | 2870 | ,, |
| Dead Sea Water (sp. gr. 1·211) | | 17200 (Marcet). | |
| ,, after 3 weeks' rain (sp. gr. 1·180 Squire). | | | |

Professor Clark, of Aberdeen, invented a soap test,* made by dissolving 1 oz. of white curd soap in one gallon of Proof Spirit, to ascertain the amount of Lime in Water; and proposed a method of softening all waters impregnated with Carbonate of Calcium held in solution by Carbonic Acid, by adding so much lime-water as is capable of uniting with the Carbonic Acid. The whole of the Carbonate of Calcium in the water, as well as that produced by the action of the Carbonic Acid upon the lime-water added, is precipitated, leaving the water comparatively pure. By this process three-fourths of the hardness of Thames water are removed; and the water which rises at Watford from the Chalk is reduced by Clark's process from 18 degrees of hardness to 2 or 3 degrees. Care, however, must be taken not to add more lime-water than is just sufficient for the purpose, otherwise this agent will contaminate the water. For further particulars the reader is referred to the *Pharmaceutical Journal*, vol. vi. p. 526 (May, 1847).

The Thames water, when supplied for long voyages, after being kept in tanks about four months, undergoes a kind of fermentation, which lasts for a few weeks, and after this change the water becomes bright, pleasant to drink, and will keep for months or years without further change, a property which belongs to scarcely any other river water.

Attention has been drawn to the contamination of drinking waters by the infiltration of sewage; and several wells, previously esteemed for the brilliancy and cool taste of the water, have since been abandoned as being totally unfit for drinking or culinary purposes.

## AQUA DESTILLATA. $H_2O$, eq. 18.

Water distilled from a copper still, through a block-tin worm, rejecting the first twentieth that comes over, and distilling only four-fifths of the whole.

**Tests.**—A fluid ounce evaporated in a clean glass capsule leaves scarcely a visible residue.

It is not affected by Lime Water, Sulphuretted Hydrogen, Chloride of Barium, Oxalate of Ammonium, Nitrate of Silver, or a mixture of Starch Mucilage and Iodide of Potassium. It gives only a faint yellow coloration when a solution of Potassio-mercuric Iodide (Nessler reagent) is added to 3 or 4 oz.

The waters of the British Pharmacopœia, which are all distilled, except Aqua Camphoræ and Aqua Chloroformi, are as follows; the formulæ are given under the names of the substances from which they are prepared.

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* For a more exact method of preparing Soap Solution from Oleic Acid and Caustic Soda, *see P.J.* xiii. 211.

| | |
|---|---|
| AQUA ANETHI. From the dried fruit. | Dose, ½ to 1 oz. |
| AQUA ANISI. From dried Anise fruit. | ½ to 1 oz. |
| AQUA AURANTII FLORIS. From the flowers. Imported. | ½ to 1 oz. |
| AQUA CAMPHORÆ. (Formerly Mistura Camphoræ.) | 1 to 2 oz. |
| AQUA CARUI. From the dried fruit. | 1 to 2 oz. |
| AQUA CHLOROFORMI. | ½ to 2 oz. |
| AQUA CINNAMOMI. From the bark. | ½ to 1 oz |
| AQUA DESTILLATA. | |
| AQUA FŒNICULI. From the dried fruit. | 1 to 2 oz. |
| AQUA LAUROCERASI. From fresh leaves. | ½ to 2 drms. |
| AQUA MENTHÆ PIPERITÆ. With oil and distilled. | 1 to 2 oz. |
| AQUA MENTHÆ VIRIDIS. With oil and distilled. | 1 to 2 oz. |
| AQUA PIMENTÆ. From the dried unripe berries. | 1 to 2 oz. |
| AQUA ROSÆ. From the fresh petals. | ½ to 1 oz. |
| AQUA SAMBUCI. From the fresh flowers. | ½ to 1 oz. |

## ARAROBA.

*See* CHRYSAROBINUM.

Not Official.

## ARECA.

The Seed of the Areca Catechu, Linn., the betel-nut tree. Imported from the East Indies.

This was Official in 1867 Brit. Pharm., but omitted in 1885 edition.

Three Alkaloids have been obtained from Areca: Arecoline, an alkaline, colourless, volatile liquid, soluble in Water, Alcohol, Ether, and Chloroform, and forming a crystallisable Hydrobromide; Arecaine, neutral, soluble in Water and dilute Alcohol, but insoluble in Ether, Chloroform and Benzol; and another, in much smaller quantity.—*L.* '89, i. 496.

(Ger., Semen Arecœ.)

**Medicinal Properties.**—A remedy for tape-worm. 60 grains of powdered Areca Nut made into a ball with Honey answers well as a vermifuge for a large dog. A paste is also made of the powder for a dentifrice.

Not Official.

## ARGENTUM.

SILVER.

Ag, eq. 108.

A white, malleable, ductile, and tenacious metal, bears a brilliant polish, and is soft when pure. Sp. g. 10·5; fuses at between 1800° and 1900° F. It was one of the earliest known metals, the Luna or Diana of the alchemists. It occurs native, sometimes arborescent, sometimes in masses; it is seldom, however, pure. The mines of Peru and Mexico are the richest. The mines of Saxony, Bohemia, Swabia, and Kongsberg in Norway, are the richest in Europe. It has been found in Cornwall and Devonshire as a sulphuret.

Metallic Silver can be distinguished from other metals resembling it (except Aluminium or Platinum) by not being affected by a solution (10 per cent.) of Nitrate of Silver. The other metals give a black stain.

Silver is readily acted on by Sulphuretted Hydrogen.

Its solutions are distinguished from those of all other metals by giving a white curdy precipitate with Hydrochloric Acid, insoluble in Nitric Acid, but soluble in excess of Ammonia.

## ARGENTUM PURIFICATUM.

### REFINED SILVER.

**Tests.**—If Ammonia be added in excess to a solution of the metal in Nitric Acid, the resulting solution exhibits neither colour nor turbidity. 10 grains dissolved in a little Nitric Acid, the Solution diluted with Water, and Diluted Hydrochloric Acid added in slight excess, yields a white precipitate which, when thoroughly washed, dried, and heated, weighs 13·25 grains. Used only to prepare Nitrate of Silver.

(Belg., Dan., Dutch, Ger. and Russ., Argentum Foliatum; Fr., Argent Purifié; Ital., Argento; Span., Plata Pura; not in the others.)

## ARGENTI NITRAS.

### NITRATE OF SILVER.

*B.P.Syn.*—Lunar Caustic.

$AgNO_3$, eq. 170.

In colourless tabular right rhombic prisms, or in white cylindrical rods.

**Solubility.**—100 grains in 50 minims of Water, measuring 80 minims; 1 in 18 of Rectified Spirit. Insoluble in strong Nitric Acid.

**Tests.**—An aqueous solution gives, with Hydrochloric Acid, a curdy white precipitate, which darkens by exposure to light, and is soluble in Solution of Ammonia. A small fragment heated on charcoal with the blow-pipe first melts, and then deflagrates, leaving behind a dull white metallic coating. 10 grains dissolved in 2 fluid drachms of Distilled Water give, with Hydrochloric Acid, a precipitate (Chloride of Silver), which, when washed with hot Distilled Water and thoroughly dried, weighs 8·44 grains—indicating the proper amount of metal. The filtrate, when evaporated by a water-bath, leaves no residue—indicating absence of impurities.

Nitrate of Silver may be adulterated with Nitrate of Sodium or Potassium, and these, of course, will remain after the Chloride of Silver has been precipitated and removed.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S. Also fused Nitrate of Silver in all except Dan., Ger., Ital., Swed. and Swiss.)

**Medicinal Properties.**—Tonic, antispasmodic, and astringent. It is said to be useful in cholera and angina pectoris, as well as in chronic diseases of the stomach; also in some nervous diseases, as epilepsy and locomotor ataxy. It is employed in chronic dysentery as an **enema,** 60 grains dissolved in 60 ounces of water, and as a **bougie** in chronic gonorrhœa. A dark line on the edges of the gums, removable by a course of Acid Tartrate of Potassium, precedes the immovable discolouration of the skin produced by the long-continued internal administration of this Salt.

Externally as a local stimulant to indolent ulcers, fistula, &c., and aphthous affections of the mouth, and as a caustic to poisoned wounds. As a local application to prevent pitting in small-pox, and to relieve the itching in pruritus; it is also applied, under Cocaine, to ulcers of the cornea. 1 to 3 grains to the ounce is employed for **lotions** and **collyria.**

Chilblains are sometimes painted with a strong solution of Nitrate of Silver.

A weak solution (1 in 500) for obstinate forms of eczema in children.—*L.M.R.* '88, 525.

Strong Solution of Iodide of Potassium, or Cyanide of Potassium, has been suggested for the removal of the black stains on the skin produced by Nitrate of Silver.

**Dose.**—$\frac{1}{6}$ to $\frac{1}{3}$ gr. or more. Prescribed in **pills** with Massa Kaolin.

$\frac{1}{60}$ gr. three times a day is a nerve tonic.

For application to the skin, a **solution** in Spirit of Nitrous Ether has been recommended. This solution throws down a light coloured precipitate, but does not itself blacken like a simple spirituous solution. It, however, blackens the skin in a shorter time.

**Incompatibles.**—The Alkalies and their Carbonates; all Bromides, Chlorides, Iodides and Phosphates; Solutions of Arsenic, and astringent infusions.

**Antidotes.**—Aqueous solution of Common Salt; milk or some demulcent drink given freely; Emetic; White of Egg.

## Preparations.

### ARGENTI ET POTASSII NITRAS. *B.P.Syn.*—MITIGATED CAUSTIC.

Nitrate of Silver, 1; Nitrate of Potassium, 2: fuse and mix thoroughly together in a capsule of platinum or thin porcelain, and pour the melted mass into proper moulds. =(1 in 3).

**Tests.**—30 grs. dissolved in $\frac{1}{2}$ oz. of Distilled Water gives with Hydrochloric Acid a precipitate which, when washed with hot Distilled Water and thoroughly dried, weighs 8·44 grs.; the filtrate will then give the reactions for Nitrate of Potassium.

(Austr. and Ger., Argentum Nitricum c. Kalio Nitrico, 1 in 3; Dan. and Swed., Nitras Argenticus bis Mitigatus, 1 in 3; Norw. and Swed., Nitras Argenticus Mitigatus, 1 in 2; Fr., Crayons d'Azotate d'Argent Mitigé, containing $\frac{9}{10}$, $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ of Nitrate of Silver; Russ., Argentum Nitricum Mitigatum, 1 in 3; Swiss, Argentum Nitricum cum Kalio Nitrico, 1 in 3; U.S., Argenti Nitras Dilutus, 1 in 3; not in the others.)

### TOUGHENED NITRATE OF SILVER, OR TOUGHENED CAUSTIC.

Add Nitrate of Potassium, 5, to Nitrate of Silver, 95, and fuse together.

Nitrate of Lead used and stated to be better for the purpose.—*Y.B.P.* '82 519.

(Same as Ital., Nitrato di Argento Fuso con Nitrato di Potassio, and Swiss, Argentum Nitricum Fusum.)

**Test.**—10 grs. will yield with Hydrochloric Acid 8 grs. of precipitate, and the filtrate when evaporated will leave a white residue.

**Not Official.**

**MILD CAUSTIC POINTS**, made by fusing Nitrate of Potassium in various proportions with Nitrate of Silver, are used by oculists and others; thus—

No. 1 consists of 1 Nitrate of Silver and 2 of Nitrate of Potassium. (OFFICIAL.)
2 „ 1 „ 3 „
3 „ 1 „ 3½ „
4 „ 1 „ 4 „

**ARGENTI IODIDUM NASCENT.**—Freshly precipitated Iodide of Silver has been recommended in conjunctival catarrhs. *See* Warlomont's formula.—*L.M.R.* '86, 498.

## ARGENTI OXIDUM.

OXIDE OF SILVER.

$Ag_2O$, eq. 232.

An olive-brown powder, insoluble in Water, but soluble in Nitric Acid, prepared by precipitating Solution of Nitrate of Silver with Lime Water.

**Tests.**—When heated to redness, 29 parts leave 27 of Metallic Silver, the Oxygen passing off as Gas. It is dissolved by Nitric Acid, without the evolution of any Gas (absence of Carbonate), forming a Solution which has the character of Nitrate of Silver.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—It has the general therapeutic qualities of the Nitrate, without its escharotic effect, and is said to be less liable to discolour the skin. A valuable astringent in hæmorrhages.

**Dose.**—½ to 2 grs. in form of **pill**, made with Kaolin Mass.

If prescribed with Creasote or with the Chlorides in pills, the Oxide must be first diffused through some inert powder such as Kaolin, or the heat produced in rapidly reducing the Silver or Chlorine combining with it, causes the mass to become red-hot, or to explode.

**Incompatibles.**—Bromides, Chlorides, and Iodides.

**Not Official.**

### ARISTOL.

An Iodine derivative of Thymol, introduced as a substitute for Iodoform, over which it has the advantage of possessing very little odour. A reddish powder, practically insoluble in Water, Glycerine, and Rectified Spirit, dissolves readily 1 in 10 of Ether or Chloroform, and about 1 in 50 of Liquid Paraffin or fixed Oils. Used as a 10 p. c. **Ointment**, or by dusting the powder on the part.

## ARMORACIÆ RADIX.

HORSERADISH ROOT.

The fresh root of the *Cochlearia armoracia*. From plants cultivated in Britain, and most active in the autumn and early spring before the leaves have appeared.

Taste very pungent, but inodorous, except when scraped or bruised, when it exhales a characteristic pungent odour.

In the presence of Water or weak spirit, decomposition takes place similar to that with a mixture of Black and White Mustard, which results in the formation of an essential Oil.

The root may be kept fresh for some time if buried in sand and in a cool place.

Aconite Root has been mistaken for this root, which seems incredible, unless we reflect that country people are in the habit of putting into the ground again Horseradish that has been scraped until only the crown and a remnant of the root vanishing to a point remain, resembling the tap-root of Aconite.

(Belg.; Fr., Raifort; Port., Rabaõ Rustico; Span., Rabano Rusticano; not in the others.)

**Medicinal Properties.**—It is highly stimulant, exciting the stomach, and promoting the secretions, especially that of urine. Used in atonic dyspepsia; also as a sudorific in chronic rheumatism. The infusion is used as a **gargle** for aphonia.

### Preparation.

**SPIRITUS ARMORACIÆ COMPOSITUS.**

Horseradish Root scraped, 20; dried Orange Peel cut small and bruised, 20; Nutmeg bruised, ½; Proof Spirit, 160; Water, 60; mix, and distil over 160. =(1 in 8).

Sp. g. about ·920.

**Dose.**—1 to 2 drms.

(Not in the other Pharmacopœias; Belg., Dutch and Port., have a Spiritus; Belg., a compound Syrup; Port., a compound Wine; Fr., Teinture de Raifort Comp.; Span., Alcohol de Cochlearia Comp.; they all differ widely from the above.)

### Not Official.

**INFUSUM ARMORACIÆ COMPOSITUM.**—Fresh Root, sliced, 1; Black Mustard Seed, 1; Compound Spirit of Horseradish, 1; boiling Distilled Water, 20: macerate two hours; strain, and add the spirit.

**Dose.**—1 to 2 oz. as a warm stimulant. Used also as a gargle for aphonia.

It is found in practice that a temperature of 150° to 180° F. makes the strongest infusion.

## ARNICÆ RHIZOMA.

ARNICA RHIZOME.

*B.P. Syn.*—ARNICÆ RADIX.

The dried rhizome and rootlets of the *Arnica montana.*

Collected in the mountainous parts of Central and Southern Europe.

(Austr., Ital., Port., Swed. and U.S., **root** and **flowers**; Fr., Hung. and Span., **root, leaves,** and **flowers**; Belg., Dan., Dutch, Ger., Norw., Russ. and Swiss, **flowers.**)

**Medicinal Properties.**—Stimulant, acting on the brain and the whole nervous system; irritant to the stomach and bowels. The Tincture is used externally for bruises and wounds, diluted with Water; but Sir A. Garrod states that equally good results are produced by the application of Spirit and Water.

### Preparation.

TINCTURA ARNICÆ.

Arnica Rhizome, in No. 40 powder, 1; Rectified Spirit to percolate 20; macerate forty-eight hours with 15 of the spirit, agitating occasionally; pack in a percolator, and when it ceases to drop, pour on the remaining 5 of spirit; afterwards subject the contents of the percolator to pressure, filter and add sufficient Rectified Spirit to make 20. =(1 in 20).

**Dose.**—½ to 1 drm.

(Belg., Fr., Span. and U.S., 1 in 5; Dan., Dutch, Ger., Norw., Port., Russ., Swed. and Swiss, 1 in 10, all from **flowers**; Port., 1 in 5, U.S., 1 in 10, from the **root**; Ital., **flowers** 1, **root** 1, Alcohol (60 p. c.) 10; Austr., **root** 4, **flowers** 1, Alcohol (70 p. c.) 25; Hung., **root** 6, **leaves** 3, and **flowers** 1, dilute Alcohol (70 p. c.) 50; Fr. and Swiss, **fresh flowers** 1, Alcohol 1; all are by weight except U.S.)

A popular remedy used externally for bruises, mixed with hot water, and applied with lint; but sometimes an erysipelatoid inflammation of the skin follows its use. It has been suggested that this "inflammation" has been due to the larvæ of *Atherix maculatus* when the Tincture has been made from the flowers.—*L.M.R.* '80, 227.

Symptoms of poisoning by Arnica are violent vomiting, intense headache, diarrhœa, colic, depression of pulse.

**Antidotes.**—Opium, Morphine.

### Not Official.

**ARNICA OPODELDOC.**—White Soap, 4; Rectified Spirit, 10; Tincture of Arnica, 5; Camphor, 1. Dissolve by heat, and strain.

**EXTRACTUM ARNICÆ RADICIS FLUIDUM** (U.S.).—1 in 1, made with Alcohol, 3; Water, 1.

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### Not Official.

## ARSENIUM.

As, eq. 75.

A bluish-grey metal, of great brilliancy, quickly tarnishing on exposure. It has a sp. g. of 5·7 to 5·9, and volatilises at 356° F. (180° C.), its fumes having the odour of garlic.

It is found in most countries, usually combined with other metals. Its oxide is also a natural production, though chiefly found in the flues of furnaces in which various metallic ores are roasted.

*See* ACIDUM ARSENIOSUM.

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### Not Official.

## ARSENII BROMIDI LIQUOR.

LIQUOR POTASSII ARSENIATIS ET BROMIDI. CLEMENS' SOLUTION.

Arsenious Acid, 73 grs.; Bicarbonate of Potassium, 73 grs.; Bromine, 117 grs.; Water, sufficient to measure 16 oz.: boil the Arsenious Acid and Bicarbonate of Potassium in 2 oz. of Water till dissolved; when cold add 10 oz. of Water, then the Bromine, and make up with Water to the given volume. Stir occasionally during a few hours, then filter.

This Liquor was originally described by Dr. Clemens as "a chemical union of Arsenic and Bromine," but as the action of Bromine on Arsenious Acid results in the formation of Arsenic Acid and Hydrobromic Acid, the above formula has been adjusted (*U.S.N.F.*) to yield these products as Potassium Salts.

The Solution contains Arsenic equal to one per cent. of Arsenious Acid.

Recommended in the treatment of diabetes.—*L.M.R.* '83, 86.

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## ARSENII IODIDUM.

### IODIDE OF ARSENIC.

$AsI_3$, eq. 456.

Obtained by direct combination of Iodine and Metallic Arsenium or by evaporating to dryness an aqueous mixture of Arsenious and Hydriodic Acids.

Small orange-coloured crystals, readily and almost entirely soluble in Water and in Rectified Spirit.

**Solubility.**—1 in 11 of Water; 1 in 42 of Rectified Spirit; 1 in 19 of Bisulphide of Carbon.

It is gradually decomposed by boiling Water and by boiling Alcohol.

Its aqueous solution has a neutral reaction, and gives a yellow precipitate with Sulphuretted Hydrogen.

**Test.**—Heated in a test-tube it almost entirely volatilises, violet vapours of Iodine being set free.

Its aqueous solution is neutral when first made, but rapidly decomposes into free Arsenious and Hydriodic Acids.

**Dose.**—$\frac{1}{30}$ of a grain in a pill.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been used in obstinate cutaneous affections of syphilitic origin, but is generally given as Donovan's Solution.

### Preparation.

**LIQUOR ARSENII ET HYDRARGYRI IODIDI**, *B.P.Syn.*—Donovan's Solution.

Iodide of Arsenium, 45 grs.; Red Iodide of Mercury, 45 grs.; Distilled Water a sufficiency. Triturate the Iodides with about $1\frac{1}{2}$ oz. Water until nearly all is dissolved; pass it through a filter, and wash the latter with sufficient Distilled Water to make with the former 10 fl. oz. =(1 grain in 110 minims).

A clear pale yellow liquid with a metallic flavour, sp. g. 1·016.

This solution is rather stronger than the old Donovan's Solution, as it contains the equivalent of about 1 per cent. of each of the Iodides.

**Test.**—Sulphuretted Hydrogen throws down a precipitate partially insoluble in strong Nitric Acid; while the dissolved part, when diluted, yields a yellow precipitate on the gradual addition of Solution of Sulphydrate of Ammonium.

On the addition of the Sulphydrate of Ammonium to the Nitric Acid Solution, a copious precipitation of free Sulphur may be expected, and it should be noted that the precipitated Sulphide of Arsenic is soluble in excess of the reagent. A much better separation of the mixed Sulphides is made with warm Solution of Carbonate of Ammonium.

**Dose.**—10 to 30 minims, diluted with Water.

(U.S., 1 in 100; not in the other Pharmacopœias.)

**Incompatibles.**—Acids, the Salts of Morphine, and Corrosive Sublimate.

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## ASAFŒTIDA.

ASAFŒTIDA.

The gum-resin exuded from the incised living root of *Ferula narthex* and of *Ferula scorodosma,* and probably other species.

Procured in Afghanistan, and the neighbouring countries. Imported from Bombay.

It occurs usually in irregular masses, composed of tears agglutinated together by a darker coloured and softer material.

The freshly fractured surface of a tear when touched with Nitric Acid assumes, for a short time, a fine green colour.

It should yield not more than 10 per cent. of ash. 50 to 60 per cent. should be soluble in Rectified Spirit.

Analyses have been published showing over 50 per cent. of Ash, but the most recent examinations (*P.J.* xxii. 391) give 7 to 14 per cent. A Volatile Oil (said to contain 20 to 25 per cent. of Sulphur) is present to the extent of 3 to 10 per cent.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.)

**Medicinal Properties.**—Stimulant, antispasmodic, expectorant, and laxative. Useful in cases of flatulency in the bowels, in hysteric paroxysms, and other kinds of nervous affections; also in some forms of chronic bronchitis.

Was recommended by the late Mr. Worms for the Cattle Plague.

**Dose.**—5 to 20 grs.

Contained in Pilula Aloes et Asafœtidæ.

### Preparations.

**ENEMA ASAFŒTIDÆ.**

Asafœtida, 30 grs.; Distilled Water, 4 oz.; rub the Asafœtida with the Water added gradually so as to form an emulsion, for one enema.

(Not in the other Pharmacopœias.)

**PILULA ALOES ET ASAFŒTIDÆ,** 1 in 4. *See* ALOES.

**PILULA ASAFŒTIDÆ COMPOSITA.** *B.P.Syn.*—PIL. GALBANI COMP.

Asafœtida, 2; Galbanum, 2; Myrrh, 2; Treacle by weight, 1; melt together in a water bath, and stir together until the mass assumes a uniform consistence. = (Asaf. and Galb., of each, 1 in $3\frac{1}{2}$).

As this mass is unsatisfactory for dispensing the following method is recommended. Powder the Myrrh, mix it with the Asafœtida and Galbanum melted on a water-bath, allow the mixture to cool, and after chilling it by artificial means reduce it to powder with $\frac{1}{6}$ of its weight of Light Carbonate of Magnesium. This powder will keep well and can be made into pills as required with the aid of Proof Spirit.

**Dose.**—5 to 10 grs.

(Port., similar to Brit.; U.S., Asafœtida 20, Soap 6; Swed., has Pilula Fœtida Succinata, but very different from Brit.; not in the other Pharmacopœias.)

**SPIRITUS AMMONIÆ FŒTIDUS,** 38 grs. in 1 oz. *See* AMMONIA.

### TINCTURA ASAFŒTIDÆ.

Asafœtida (small fragments), 1; Rectified Spirit, a sufficiency; macerate seven days in 6 of the spirit in a closed vessel, with occasional agitation, filter, and add Rectified Spirit to make 8. = (1 in 8).

**Dose.**—$\frac{1}{2}$ to 1 drm.

(Belg., Dan., Dutch, Fr., Norw., Port., Russ., Span., Swed. and Swiss, 1 and 5; Swiss and U.S., 1 in 5; all by weight except U.S.; not in Austr., Ger., Hung. or Ital.)

Prescribed with Aromatic Spirit of Ammonia, or with Mucilage, as the resin separates when mixed with Water only; alone or with Tinctures of Valerian and Hyoscyamus, in flatulent hysteria.

## ATROPINA.

ATROPINE.

An alkaloid, in colourless acicular crystals, $C_{17}H_{23}NO_3$, eq. 289, obtained from Belladonna.

In the B.P. process for the extraction of Atropine from Belladonna, the directions are to add to a slightly acid solution of the alkaloid, "Carbonate of Potassium in such quantity that the liquid shall acquire a decided alkaline reaction," after which the liberated alkaloid is to be shaken out with Chloroform.

The fact has obviously been overlooked that Atropine itself has a "decided alkaline reaction," and therefore the yield of alkaloid will depend upon the extent to which the official directions have been exceeded. A considerable excess of Carbonate of Potassium, over and above the theoretical quantity necessary to decompose the Atropine Sulphate, greatly facilitates the Chloroform extraction.

It seems a well established fact that the bulk of the alkaloid existing in Belladonna is Hyoscyamine and not Atropine. The two are isomeric, and the former has a constant tendency to change into the latter.

A solution 1 in 200 heated in a basin on a water-bath for two hours was so completely decomposed that it lost its alkaline reaction and ceased to precipitate with Mercuric Chloride; after eight hours the reaction was faintly acid.

**Solubility.**—1 in 500 of Water; 1 in 3 of Rectified Spirit; 1 in 25 of Ether; 1 in 1 of Chloroform; 1 in 52 of Glycerine; 1 in 15 of Oleic Acid.

**Tests.**—Its solution in Water has an alkaline reaction, powerfully dilates the pupil, and gives a citron-yellow precipitate with Chloride of Gold. Leaves no ash when burnt with free access of air.

Atropine **melts** when pure at 114° C. according to Ladenburg, or at 115° to 115·5° C. according to Schmidt; but the commercial alkaloid often begins to melt at about 104° and is entirely melted at 113° C.—*Allen.*

Atropine and other solanaceous alkaloids are characterised by—1. Alkaline reaction to litmus and phenol-phthalein; 2. Mydriatic action; 3. Reduction of Mercury Salts to oxides; 4. Purple colour with Nitric Acid and Alcoholic Potash; 5. Fluorescence with Glacial Acetic and Sulphuric Acids.

The colour reaction No. 4 is very delicate, but is also given by Aconitine and Veratrine.

The distinctions between Atropine and the other mydriatic alkaloids are :—1. Melting point; 2. Melting point of Sulphate; 3. Melting point of double Gold Chloride; 4. Yielding the *red* Oxide of Mercury even with a large excess of Perchloride. *See also* Belladonna, Homatropine, Hyoscyamine, &c.

(Belg., Dutch, Fr., Ital., Port., Span. and U.S.; not in the others.)

**Medicinal Properties.**—Used externally in applications for the relief of pain, more particularly that arising from muscular spasm. It checks excessive secretion from the sweat and salivary glands.

As a Sulphate in solution it is used for ophthalmic purposes, as, like Belladonna, it dilates the pupil of the eye, also by hypodermic injection.

The Unguentum Atropinæ is a much cleaner preparation than Unguentum Belladonnæ.

It is used as an antidote in poisoning by Aconite, Gelsemine, Hydrocyanic Acid, Morphine, Muscarine, Nitro-Glycerine, Physostigmine, and Pilocarpine.

Has been recommended in hæmoptysis by **hypodermic injection** of $\frac{1}{300}$ to $\frac{1}{130}$ grain.—*B.M.J.* '87, i. 842.

A case of traumatic tetanus cured by hypodermic injection of Atropine (4-minim doses of B.P. Liquor).—*L.* '35, ii. 849.

**Antidotes.**—In case of poisoning by Atropine, the antidotes are the same as for Belladonna.

## Preparation.

### UNGUENTUM ATROPINÆ.

Atropine, 8 grs.; Rectified Spirit, ½ drm.; Benzoated Lard, 1 oz.: dissolve the Atropine in the Spirit, and mix with the Lard.
=(about 1 in 60).

Benzoated Lard is now ordered in the place of Lard, which is a mistake; it makes the ointment much too irritating for the eyes; the ointment also is too strong for ophthalmic use, half the strength would be better.

(Not in the other Pharmacopœias.)

## Not Official.

**OLEATUM ATROPINÆ.**—Atropine, 8 grs.; Oleic Acid, 1 oz.: dissolve with a heat not exceeding that of a water bath.

The same strength as Unguentum Atropinæ.

**UNGUENTUM ATROPINÆ** (*L.O.H.*).—Atropine, 4 grs.; Soft Paraffin, 1 oz.: heat till dissolved and stir till cold.

**UNGUENTUM ATROPINÆ CUM COCAINA** (*L.O.H.*).—Atropine, 4 grs.; Cocaine 10 grs.; Soft Paraffin, 1 oz.: heat till the alkaloids are dissolved.

**ATROPINÆ SALICYLAS.**—Introduced as a substitute for the Sulphate, but its aqueous solution does not keep so well as that of the latter.

(Russ.; not in the other Pharmacopœias.)

# ATROPINÆ SULPHAS.

## SULPHATE OF ATROPINE.

It is crystalline or pulverulent, and nearly colourless; obtained by neutralising Atropine in Solution with Diluted Sulphuric Acid, and evaporating to dryness at a temperature not exceeding 100° F. (37·8° C.)

According to Hesse, pure Sulphate of Atropine has the formula $(C_{17}H_{23}NO_3)_2.H_2SO_4.H_2O$ (equivalent to 83·3 per cent. of Atropine), the molecule of Water of crystallisation being easily removed at 100° C.; also that optical analysis has shown commercial Atropine Sulphate to consist (to the extent of two-thirds) of Hyoscyamine Sulphate. They may also be separated as Oxalates, by dissolving the bases in Acetone and the Oxalic Acid in Ether; on mixing, the Atropine Salt separates out first. The medicinal action of the two alkaloids is practically identical.—*P.J.*, xxiii. 201.

**Melting point** of Sulphate of Atropine is 196° C., and that of Sulphate of Hyoscyamine is 260° C.—*Will. P.J.* xviii. 1047.

**Solubility.**—10 in 4 of Water; 1 in 3 of Rectified Spirit. Insoluble in Ether and Chloroform.

**Tests.**—It leaves no residue when burned with free access of air. Its solution in Water dilates the pupil of the eye, and should be neutral to test-paper.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Employed to dilate the pupil and to paralyse the accommodation. It is frequently combined with Morphine in hypodermic administration. It arrests the secretion of Milk and secretion from the bronchial tubes, also to check the sweating of phthisis. The Sulphate is best adapted for Aqueous Solutions, and the pure alkaloid for Ointments. *See* also Atropine and Belladonna.

B.P. states "Intended for external administration. It is a powerful Poison."

Austr., Belg., Dutch, Ger., Ital., Norw., Russ., Swed. and Swiss give the maximum dose as ·001 milligramme = $\frac{1}{65}$ grain.

### Preparations.

**LAMELLÆ ATROPINÆ.** Discs of Atropine.

Discs of Gelatine, with some Glycerine, each weighing about $\frac{1}{50}$ grain and containing $\frac{1}{5000}$ grain Sulphate of Atropine.

Atropine Gelatine can be obtained as round discs in a bottle, or as squares in a sheet for the pocket-book.

Gelatine discs are also made containing $\frac{1}{250}$ grain Atropine to paralyse the accommodation, also Atropine $\frac{1}{5000}$ grain and Cocaine $\frac{1}{200}$ grain.

Gelatine discs for **hypodermic use** $\frac{1}{120}$ grain.

**LIQUOR ATROPINÆ SULPHATIS.**

Sulphate of Atropine, 9 grs.; Camphor Water, $16\frac{1}{2}$ fl. drs.: dissolve. =(1 in 100).

1 grain in 110 minims. Half this strength is sufficient for ordinary purposes.

Solutions of Sulphate of Atropine are more suitable for ophthalmic use than those of Atropine, as the latter requires spirit for its solution.

**Dose.**—1 to 4 minims = $\frac{1}{110}$ to $\frac{1}{28}$ grain of Sulphate of Atropine.

(Norw., 1 in 200; Port., 1 in 100; not in the other Pharmacopœias.)

### Not Official.

**GUTTÆ ATROPINÆ SULPHATIS** (*L.O.H.*).—Sulphate of Atropine 2 grains; Distilled Water, 1 oz.

**GUTTÆ ATROPINÆ SULPHATIS FORTIORES** (*L.O.H.*).—Sulphate of Atropine, 4 grains; Distilled Water, 1 oz.

**GUTTÆ ATROPINÆ SULPHATIS MITIORES** (*L.O.H.*).—Sulphate of Atropine, 1 gr.; Distilled Water, 1 oz.

**INJECTIO ATROPINÆ HYPODERMICA.**—Sulphate of Atropine, 2 grs.; Water, 1 oz.

**Dose.**—2 to 4 minims = $\frac{1}{120}$ to $\frac{1}{60}$ grain of Sulphate of Atropine.

**INJECTIO ATROPINÆ ET MORPHINÆ.** *See* Morphinæ Acetas.

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## AURANTII CORTEX.

### BITTER-ORANGE PEEL.

*B.P. Syn.*—Aurantii Pericarpium.

The dried outer part of the Rind or Pericarp of *Citrus vulgaris* (*Citrus bigaradia*).

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Arancio Amaro), Norw., Port. (Laranjeira Azeda), Russ., Span. (Naranjo Agrio), Swed. and Swiss; U.S., Aurantii Amari Cortex, also Aurantii Dulcis Cortex.)

**Medicinal Properties.**—It is a mild tonic, carminative and stomachic; a useful addition to bitter Infusions and some Decoctions.

Preparations of Orange Peel should not be prescribed with Tincture of Perchloride of Iron, as the mixture would be blackened.

Used in the preparation of Infusum Gentianæ Compositum, Spiritus Armoraciæ Compositus, Tinctura Cinchonæ Composita, and Tinctura Gentianæ Composita.

### Preparations.

**INFUSUM AURANTII.**

Dried Bitter Orange Peel, cut small, 1; boiling Water, 20: infuse for fifteen minutes and strain. =(1 in 20).

**Dose**—1 to 2 oz.

(Not in other Pharmacopœias. Fr. (Tisane d'Oranger), Leaves 5, Boiling Water 1000.)

**INFUSUM AURANTII COMPOSITUM.**

Dried Bitter Orange Peel, cut small, ½ oz.; Fresh Lemon Peel, cut small, 112 grs.; Cloves, bruised, 56 grs.; boiling Water, 20 oz.: infuse for fifteen minutes and strain. =(1 in 40).

The Brit. Pharm. gives the relative proportions as 4, 2, 1, 160. These are not quite correct, and as the quantities were altered in 1885, the grains and parts might as well have been made to agree.

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias.)

### SYRUPUS AURANTII.

Tincture of Orange Peel, 1; Syrup, 7: mix. =(1 in 8). Sp. g. about 1·282.

**Dose.**—1 to 2 drms.

(Austr. and Hung., peel, weak spirit, sugar, and tincture; Belg., Port. and Swed., peel, water, and sugar; Dan., peel, spirit, water, and sugar; Dutch, peel, water, and sugar; Fr., peel, spirit, water, and sugar; also Citric Acid, water, and sugar, with Alcoolature d'Orange; Ger. and Russ., peel, wine, and sugar; Ital. and U.S., peel, spirit, water, and sugar; Norw., tincture 1, syrup 9; Span., peel, water, and sugar; Swiss, peel, white wine, and sugar. All by weight except U.S.)

Used in the preparation of Confectio Sulphuris.

### TINCTURA AURANTII.

Dried Bitter Orange Peel, cut small and bruised, 1; Proof Spirit, 10; macerate for seven days in a closed vessel with occasional agitation, then strain, press, and filter; add sufficient Proof Spirit to make 10. =(1 in 10).

**Dose.**—1 to 2 drms.

It is much prescribed with Mineral Acids, also with Quinine in tonic mixtures.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Norw., Russ., Span., Swed., Swiss and U.S., 1 in 5; all by weight except U.S.; not in Ital. or Port.)

Used in the preparation of Mistura Ferri Aromatica, Syrupus Aurantii, Tinctura Quininæ, and Trochisci Sulphuris.

## AURANTII FRUCTUS.

BITTER ORANGE.

The ripe Fruit of the *Citrus vulgaris* (*Citrus Bigaradia*).

The outer paring of the rind is the only part used for preparations.

It is most plentiful in the market during February and March.

(Same as Belg., Fr., Port. and Span.; U.S., *Citrus Aurantium*. The following use the unripe fruit: Dan., Ger., Norw., Russ. and Swed.)

Preparations.

### TINCTURA AURANTII RECENTIS.

The thin yellow and fresh Rind of Bitter Orange, 6; macerate for 7 days in 18 of Rectified Spirit, with frequent agitation; strain, press, and filter; finally, if necessary, add Rectified Spirit to make 20. = (3 in 10).

**Dose**—1 to 2 drms.

(Fr. (Alcoolature d'Orange), fresh peel 1, alcohol 2, by weight; U.S. (Tinctura Aurantii Dulcis) from fresh peel, 1 in 5; not in the others.)

### VINUM AURANTII.

Wine made in Britain by the fermentation of a saccharine solution to which the fresh peel of the Bitter Orange has been added, containing 10 to 12 per cent. of Alcohol and but slightly acid to test-paper.

It is, in fact, the Orange Wine sold in the shops of grocers and others.

This wine contains on an average about 20 per cent. of total solids, three-fourths of which is Glucose. Total acidity is equal to about ½ per cent. Citric Acid.

Sp. g. of samples examined 1·057 to 1·080.

Introduced to prepare Quinine Wine, also Vinum Ferri Citratis.

### Not Official.

**ELIXIR ADJUVANS** (*U.S.N.F.*).—Sweet Orange Peel, fresh, 3 oz.; Wild Cherry Bark, 1 oz.; Liquorice Root, decorticated and dried, 2 oz.; Coriander, ¼ oz.; Caraway, ¼ oz.; all troy weight; percolate with a mixture of Rectified Spirit 1 and Water 2 to obtain 24 fl. oz. and add Syrup 16 fl. oz.

**VINUM AURANTII DETANNATUM** (*B.P.C.*).—Orange Wine, 1 gallon; Gelatine, cut small, 2 oz.; macerate for fourteen days, and decant.

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### Not Official.

## OLEUM AURANTII CORTICIS.

A volatile Oil, extracted by mechanical means from Fresh Orange Peel; both varieties of Orange Peel are used; that from Citrus vulgaris is known as *Essence de Bigarade,* and that from Citrus Aurantium as *Essence de Portugal*; the former yields the finest Oil.

A pale yellowish liquid, with neutral reaction, having the odour of Orange Peel. It consists principally of a terpene $C_{10}H_{16}$ named Hesperidine, which boils at 178° C. The Oil is strongly dextro-rotary (160°—200°). Sp. g. ·840—·860.

**Solubility.**—1 in 7 of Rectified Spirit; in all proportions of Absolute Alcohol.

By keeping, the Oil becomes thicker and acquires a disagreeable terebinthinate taste, which may be prevented by mixing it while fresh with 10 per cent. of Absolute Alcohol.

> (Austr., sp. g. ·860; Belg., sp. g. ·835—·844; Dutch, sp. g. ·850—·870; Fr.; Hung., sp. g. ·850—·860; Ital., sp. g. ·851; Port., sp. g. ·835—·850; Russ., sp. g. ·830—·835; U.S., sp. g. about ·860; not in Dan., Ger., Norw. or Swed.)

### Preparations.

**ELIXIR AURANTII** (formerly *U.S.,* now omitted).—Sprinkle or spray 1 oz. of Oil of Orange over 2 oz. of Cotton Wool; pack it tightly in a percolator and pass through it a mixture (Alcohol 1, Water 3), sp. g. ·971, till 200 oz. of a clear percolate are obtained, in which dissolve without heat Sugar 100; all by weight.

A better method of disseminating the Oil, is to sprinkle it upon blotting paper, pulp this with the diluted Alcohol, allow it to stand for 24 hours, and filter.

**ELIXIR SIMPLEX** (*B.P.C.*).—Oil of Bitter Orange, 30 mins.; Rectified Spirit, 6 oz.; dissolve and add Distilled Cinnamon Water, 7 oz.; Syrup, 7 oz. Mix. Filter through paper moistened with Proof Spirit and well sprinkled with Kaolin, returning the first portions of filtrate until it passes through bright.

**Dose.**—20 to 60 minims.

**SPIRITUS AURANTII COMPOSITUS** (*U.S.N.F.*).—Oil of Orange, 1 oz.; Oil of Lemon, ¼ oz.; Oil of Coriander, 40 mins.; Oil of Star-Anise, 10 mins.; Alcohol (sp. g. ·820) to make 5 oz.

# AURANTII FLORIS AQUA.

ORANGE-FLOWER WATER.

*N.O.Syn.*—AQUA NAPHÆ.

The distilled Water of the Flowers of the Bitter Orange tree, *Citrus vulgaris*, and of the Sweet Orange tree, *Citrus aurantium;* prepared mostly in France.

B.P. remarks that: "The Orange-flower Water of commerce is usually three times the strength of that employed in former years," but gives no hint as to the intended strength of the Official article.

U.S. directs the Triple Extract, to be diluted with an equal volume of Distilled Water.

**Test.**—Not coloured by Sulphuretted Hydrogen—indicating absence of Copper and Lead.

(Austr., Belg., Dan., Dutch, Fr. (Eau Distillée de Fleur d'Oranger), Hung., Ital. (Acqua Distillata di Arancio), Port. (Agua de Flores de Laranjeira), Russ., Span. (Agua de Azahar), Swed., Swiss, and U.S.; not in Ger. or Norw.)

**Medicinal Properties.**—Chiefly used as a flavouring vehicle; about one of the Concentrated Water to eight of Distilled Water; also in eye lotions.

Contained in Mistura Olei Ricini.

## Preparation.

### SYRUPUS AURANTII FLORIS.

Orange-flower Water, 8; Refined Sugar, 48; Distilled Water, 16, or a sufficiency; dissolve the Sugar in the Distilled Water by means of heat; strain, and when nearly cold add the Orange-flower Water with sufficient Distilled Water, if necessary, to make the product weigh 72. Sp. g. about 1·330.

**Dose.**—1 to 2 drms.

(Belg., O.F.W. 345, Sugar 655; Fr. and Span., O.F.W. 10, Sugar 18; Russ., O.F.W. 2, Water 2, Sugar 6; Port., O.F.W. 7, Sugar 13; Swiss, O.F.W. 36, Sugar 64; all by weight; U.S., Sugar 85, O.F.W. to measure 100; not in the others.)

## Not Official.

**OLEUM AURANTII FLORUM.** *Syn.*—OLEUM NEROLI.

A volatile Oil, obtained by distilling fresh Orange-flowers with Water. The watery distillate constitutes the Aqua Floris Aurantii Conc. of commerce. The finest Oil is obtained from the Bitter Orange; that from the Portugal or Sweet Orange is not so good. From the *leaves* of both varieties is obtained the commercial **Oil of Petit Grain.**

A yellowish or brownish thin liquid, with neutral reaction, having a powerful odour of Orange-flowers.

**Solubility.**—In all proportions of Rectified Spirit or Absolute Alcohol.

If a little Alcohol be poured on the surface of the Oil and the mixture gently undulated, a bright violet fluorescence will be observed.

(Austr., sp. g. ·890; Belg., sp. g. ·860—·870; Fr., Span. and Swiss, sp. g. not given; Ital., sp. g. ·879; Port., sp. g. ·874—·878; Russ., sp. g. ·860—·880; U.S., sp. g. ·875—·890; not in Dan., Dutch, Ger., Hung., Norw. or Swed.)

Not Official.

## AURI BROMIDUM.

Two Bromides of Gold appear to have been used on the Continent for the relief of hysteria and epilepsy. It is stated that the Tribromide is readily soluble, and the Monobromide insoluble, in Water.

The Tribromide obtained from Merck was soluble about 1 in 75 of Water. It appears to be about ten times more active than the more commonly used Bromides, and has been given in $\frac{1}{4}$ (increased to $\frac{1}{2}$) grain doses in severe cases of hysteria and epilepsy.—*L.* '90, i, 869.

Since the first notices in 1890, not much has been written about it.

Dispensed in **pills** with Massa Kaolin or in **compressed discs**.

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Not Official.

## AURI CHLORIDUM.

Under this heading are arranged the following varieties :—

1. **Pure Chloride of Gold**, $AuCl_3$, containing about 65 per cent. of Metallic Gold, and Official in Fr. (Chlorure d'Or), Port. (Chloreto de Ouro), and Span. (Cloruro Aurico).
2. **Chloride of Gold and Sodium** (Commercial "Chloride of Gold"), the crystallised double salt $AuCl_3.NaCl.2H_2O$, containing 50 per cent. of metallic Gold, and Official in Belg. (Chloruretum Auri et Sodii), Fr. (Chlorure d'Or et Sodium), Ital. (Cloruro di Oro e di Sodio), and Port. (Chloreto de Ouro e de Sodio).
3. **Commercial Chloride of Gold and Sodium.** Commercial Chloride of Gold and Sodium is the above crystallised salt mixed with an equal weight of Chloride of Sodium, and contains 25 per cent. of metallic Gold.
4. **Auri et Sodii Chloridum U.S.** A mixture composed of equal parts of dry Chloride of Gold and Chloride of Sodium, and which contains about 32 per cent. of pure Gold. This is Official in Dutch (Chloretum Aurico-Natricum et Chloretum Natricum), Ger., Russ. and Swiss (Auro-natrium Chloratum).

Some foreign samples of Commercial Chloride of Gold are the double Chloride of Gold and Potassium $AuCl_3.KCl.2\frac{1}{2}H_2O$, corresponding to about 47 per cent. of metal.—*P.J.* xxii. 902.

**Medicinal Properties.**—It has been given on the Continent for amenorrhœa and secondary syphilis, in the form of **pills** made with China Clay or Bolus Alba.

P.G. maximum single dose, ·05 gramme ($\frac{3}{4}$ grain); maximum daily dose, ·2 gramme (3 grains).

It is also used in photography. Its solutions should be protected from white light.

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## BALSAMUM CANADENSE.

*See* TEREBINTHINA CANADENSIS.

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Not Official.

## BALSAMUM DIPTEROCARPI.

GURJUN BALSAM, OR WOOD OIL.

(Pharmacopœia of India.)

A balsamic exudation, obtained from the Trunk of *Dipterocarpus lœvis* and other species by incision and the application of heat. Imported from the East Indies.

It is an oleo-resin, constituting a transparent liquid of the consistence of Olive Oil, lighter than Water, of a dark brown sherry colour, slightly fluorescent. Heated in a vial to 270° F. (132·2° C.) it becomes turbid and gelatinous. It affords a turbid solution when shaken with an equal volume of Benzol.

**Test.**—When dissolved in about 20 parts of Carbon Bisulphide and a drop of a cooled mixture of equal parts of Sulphuric and Nitric Acids added it takes a splendid violet colour, which lasts several hours. This reaction is not prevented by the presence of Resin or by Copaiba Balsam.—*Fluckiger.*

**Medicinal Properties.**—Useful for leprosy. Dr. Dougall used 1 part Gurjun Balsam with three parts of Lime Water to anoint the body night and morning, cleaning the body before the morning application, first with dry earth and then with water. He also gave 2 drachms of the Balsam internally night and morning, mixed with Lime Water.—*L.* '74, i. 694. Mr. J. D. Hillis, of the Leper Asylum in British Guiana, is greatly in favour of it.—*L.* '80, i. 659; *M.P.* '89, i. 664; *see* also *L.* '90, i. 136.

It is used in India as a substitute for Balsam of Copaiba in gonorrhœa; also as a natural varnish.

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## BALSAMUM PERUVIANUM.

### BALSAM OF PERU.

A Balsam obtained from *Myroxylon Pereiræ.* It exudes from the trunk of the tree after the bark has been beaten, scorched, and removed.

From San Salvador, in Central America.

A liquid somewhat less viscid than treacle, appearing nearly black in bulk, but in thin layers deep orange-brown or reddish-brown and transparent.

Sp. g. between 1·137 and 1·150.

**Solubility.**—1 in 1 of Rectified Spirit, but when more than 3 of the spirit is added to 1 of Balsam it becomes turbid; in all proportions of Chloroform; insoluble in Olive Oil.

**Tests.**—It should not diminish in volume when shaken with an equal bulk of water. 10 drops triturated with 6 grs. of Slaked Lime produces a permanently soft mixture; and the mixture on being warmed until all volatile matter is given off and until charring commences gives no fatty odour.

For papers on Tests for the purity of Balsam of Peru, *see P.J.* xii. 45; xiii. 321, 581; xiv. 424; xv. 237; xviii. 1072.

Balsam of Peru contains Cinnamic and Benzoic Acids, both of which possess antiseptic properties.

(Austr., sp. g. 1·14—1·16; Dutch and Belg., sp. g. 1·14—1·15; Dan.; Fr.; Ger., Hung. and Russ., sp. g. 1·135—1·145; Norw.; Port., sp. g. 1·15; Span., sp. g. 1·15—1·16; Swed. and Swiss; Ital. and U.S., sp. g. 1·135—1·150.)

**Medicinal Properties.**—A warm and stimulating tonic and expectorant. Useful in chronic catarrh, asthma, and other pectoral complaints, and in rheumatism; also to restrain excessive discharges, as gleets, &c.

Externally for chronic indolent ulcers and for sore nipples.

**Dose.**—10 to 15 minims as an emulsion with mucilage or sugar and yolk of egg with water.

### Not Official.

**UNGUENTUM PERUVIANUM.**—Balsam, 1; Lard, 7.

An excellent application for sore nipples or cracked lips.

**UNG. PERUVIANUM RESINOSUM.**—Balsam, 1; Resin Ointment, 1: mix. Applied upon cotton-wool for bed-sores.

## BALSAMUM TOLUTANUM.

### BALSAM OF TOLU.

A Balsam which exudes from the Trunk of *Myroxylon Toluifera*, after incisions have been made in the bark.

Imported from the northern ports of Columbia, South America.

A soft solid, which becomes harder by keeping; in thin films it is of a yellowish-brown colour. When pressed between two warmed pieces of glass and then examined with a lens it exhibits an abundance of crystals of Cinnamic Acid.

We found sp. g. of two samples to be 1·230 and 1·258.

The natural constituents of Tolu Balsam are the same as those of Peru Balsam, only they exist in smaller quantity and different proportions, Benzyl Cinnamate forming the majority in the first, Benzyl Benzoate in the second.—*Y.B.P.* '77, 101.

**Solubility.**—1 in 1 of Rectified Spirit; 1 in 3 of Benzol; 2 in 1 of Chloroform; 1 in 1 of Glacial Acetic Acid; insoluble in Benzin; nearly insoluble in Bisulphide of Carbon.

(Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Hung.)

**Medicinal Properties.**—Similar to those of the Balsam of Peru. Lozenges good for cough.

**Dose.**—10 to 20 grs., in the form of emulsion, with mucilage and sugar.

Contained in Pilula Phosphori and Tinctura Benzoini Composita.

### Preparations.

**SYRUPUS TOLUTANUS.**

Balsam of Tolu, $1\frac{1}{4}$; Sugar, 32; Water, 20; boil the Balsam with the water in a lightly covered vessel half an hour, stirring occasionally, and adding water when required; when cold, make up to 16; filter, add the Sugar, and dissolve with the aid of a steam or water bath. When finished, weighs 48 and measures 36. Sp. g. 1·330.

=(1 in $28\frac{4}{5}$).

A better flavoured Syrup may be made as follows: Balsam of Tolu, $1\frac{1}{4}$; Sugar, 8; powder the Tolu with the Sugar, macerate in Water 16, for 24 hours, with frequent agitation, filter bright and dissolve in it (cold) Sugar 24.

By the use of a little Spirit a still more strongly-flavoured Syrup may be made:

Balsam of Tolu, $1\frac{1}{4}$; Rectified Spirit, $1\frac{1}{4}$; dissolve and add the Solution to Simple Syrup, 34; shake thoroughly and filter.

**Dose.**—1 to 2 drms., in cough mixtures.

(Belg., Fr., Ital., Port., Russ., Span., Swiss and U.S.; Dan., made with Tincture; not in the other Pharmacopœias.)

### TINCTURA TOLUTANA.

Balsam of Tolu, $2\frac{1}{2}$; Rectified Spirit, a sufficiency; macerate the Balsam in 15 of the Spirit in a closed vessel with occasional agitation for six hours, or until the Balsam is dissolved; filter, and add sufficient Rectified Spirit to make 20. =(1 in 8).

**Dose.**—20 to 40 minims.

(Dan., Fr., Span. and Swed., 1 in 5; Port., 3 in 20; U.S., 1 in 10: all by weight except U.S.; not in the others.)

Contained in the Trochisci Acidi Tannici, Morphinæ, Morphinæ et Ipecacuanhæ, and Opii.

Not Official.

## BARII HYPOPHOSPHIS.

This is used in the preparation of Hypophosphorous Acid, *B.P.C.*, and is directed to contain not less than 95 per cent. $Ba.2(PH_2O_2).H_2O$, and from the tests of the Acid when made it is expected to be free from Lime.

It would appear (*P.J.* xxiii. 235) that commercial Hypophosphite of Barium is Anhydrous and generally contains Lime.

Not Official.

## BARII SULPHIDUM.

BaS eq. 169.

The chief use for this is as a depilatory, for which purpose it is unequalled, removing hair with less injury to the skin than any other application.

It is somewhat difficult to obtain in a pure condition, and commercial samples as a rule do not contain more than 50 per cent. BaS.

Some commercial samples are obviously prepared by evaporating to dryness a solution obtained by boiling Barium Hydrate and Sulphur together with Water; these evolve Sulphurous Acid on treatment with Hydrochloric Acid, while the pure Sulphide gives nothing but Sulphuretted Hydrogen.

In small quantity it may be prepared by saturating strong Baryta Water with Sulphuretted Hydrogen and evaporating rapidly to complete dryness.

Commercially it is made by exposing to a bright red heat for some time in a closed crucible a mixture of powdered Sulphate of Barium and powdered Charcoal. From the excess of Carbon and undecomposed Sulphate, the Sulphide is extracted by boiling Water.

In presence of air and moisture, Barium Sulphide rapidly deteriorates by oxidation to Sulphate.

**Test.**—For the estimation of BaS: 1. Make a standard Zinc Solution by dissolving 7·7 grm. Zinc in about 75 c. c. of Diluted Hydrochloric Acid, adding excess of Ammonia and diluting to 1000 c. c.; 2. Make an alkaline Lead Solution by dissolving 1 grm. Lead Acetate in about 20 c. c. of hot Solution of Potash and diluting to 100 c. c.; 3. Heat to boiling 1 grm. of the Barium Sulphide in about 50 c. c.

of Water and titrate with the standard Zinc Solution till no black or brown colour is obtained by adding a drop of the Barium Solution to a drop of the Lead indicator, spotted on a porcelain slab. Each c. c. of the Zinc Solution used is equivalent to 2 per cent. of Barium Sulphide in the sample operated upon.

### Preparation.

**DEPILATORY.**—Barium Sulphide (containing 70 per cent. BaS, or an equivalent quantity of any other strength) in fine powder, 2; Starch, 5; Orris Root in powder, 1; mix.

For use make it into a thin paste with Water, apply to the part from which the hair is to be removed; after five minutes scrape off with a blunt knife.

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# BEBERINÆ SULPHAS.

## SULPHATE OF BEBERINE.

*B.P.Syn.*—BEBERIÆ SULPHAS.

Prepared from *Nectandra* or *Bebeeru* Bark. B.P. gives a method for its preparation, and states that it is probably a mixture of Sulphates of Beberine $C_{36}H_{42}N_2O_6$, Nectandrine $C_{40}H_{46}N_2O_8$, and other Alkaloids.

In dark-brown thin translucent scales, yellow when in powder, with a strong bitter taste.

The Pharmacopœia preparation contains about 60 per cent. of Alkaloids, one half being **Beberine** $C_{18}H_{21}NO_3$, the remainder being other amorphous alkaloids which have not yet been separated in the pure form.

The so-called **Buxine** from Boxwood (Buxus sempervirens) and **Pelosine** from Cissampelos Pareira are identical with Beberine.—*P.J.* x. 612, and xvi. 300.

**Solubility.**—Sparingly in Spirit; dissolves about 1 in 1 of Water, and the solution can be diluted up to 1 and 8 of Water, but on further dilution it precipitates until about 80 or 100 parts of Water have been added, but samples vary in this respect.

**Tests.**—When burnt with free access of air leaves no residue. Its aqueous solution gives with Caustic Soda a yellowish white precipitate, which is dissolved by agitating the mixture with twice its volume of Ether. The ethereal solution, separated by a pipette and evaporated, leaves a yellow translucent residue entirely soluble in dilute Acids.

The greater portion of the Caustic Soda precipitate dissolves in excess of Alkali, but according to Dott this consists of alkaloids other than Beberine. This latter Hydrate, although freely soluble in Ether, is not dissolved by excess of Alkali.

(Port.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Tonic and antiperiodic, an imperfect substitute for Quinine; given in neuralgia, also in menorrhagia.

**Dose.**—1 to 3 grs. as a tonic; 5 to 10 grs. as an antiperiodic, given in **solution,** or in **pills** made with "Dispensing Syrup."

**Incompatibles.**—Alkalies and their Carbonates, Bromide and Iodide of Potassium, Lime Water, Tartaric Acid, and Tartrates, Astringent Infusions and Tinctures.

## BELÆ FRUCTUS.

BAEL FRUIT.

The dried half-ripe Fruit of *Ægle marmelos*. Usually imported in dried more or less twisted slices, or in fragments consisting of portions of the rind and adherent dried pulp and seeds.

It grows in most parts of India.

(Port., Bilva; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been much extolled for diarrhœa and dysentery, and is given in combination with Syrup of Red Gum or other astringents.

### Preparation.

**EXTRACTUM BELÆ LIQUIDUM.**

Bael Fruit, 1 lb.; Distilled Water, 15 lbs.; Rectified Spirit, 3 oz.: macerate for twelve hours in 5 lbs. of the water, pour off the liquid, repeat the operation twice for one hour. Press, filter through flannel, evaporate to 13 fl. oz., and when cold add the spirit.

A fluid ounce is equal to an ounce of Bael.

**Dose.**—1 to 2 drms.

(Not in the other Pharmacopœias.)

### Not Official.

**CONFECTIO BELÆ RECENTIS.**—Prepared from fresh fruits imported from India in the spring months. It retains the odour and flavour of the fresh fruit.

**Dose.**—A teaspoonful.

**PULVIS BELÆ RECENTIS.**—Fresh fruits, deprived of their shells, pulped in warm water, strained, and evaporated.

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## BELLADONNÆ FOLIA.

BELLADONNA LEAVES (DEADLY NIGHTSHADE).

The fresh leaves and the branches to which they are attached; also the leaves separated from the branches, carefully dried, of *Atropa Belladonna* (perennial); gathered, when the fruit has begun to form, from wild or cultivated plants growing in Britain.

It is now generally recognised that the greater portion of the Alkaloid existing in Belladonna (both leaves and root) is Hyoscyamine, rather than Atropine. A good resumé of the literature on the subject is given *P.J.* xxii. 469, from which it would appear that although Belladonna leaves may be found in the market containing as little as ·1 per cent. of Alkaloid, a good well-dried leaf should approximate to ·5 per cent., and specimens may be met with yielding as much as ·9 per cent., showing the necessity of standardising the Tincture.

(Austr., Belg., Dan., Ital., Norw., Russ., Span., Swed., Swiss and U.S., leaves; Dutch, leaves and fresh herb; Fr., leaves and fruit; Ger., leaves and branches; Port., herb; not in Hung.)

**Medicinal Properties.**—Anodyne in nervous and inflammatory affections. It is specially useful in checking the secretions of milk, sweat, and saliva. Given for the relief of some nervous disorders, as epilepsy, hooping-cough, and asthma; also in rheumatism. In large or continued doses it causes dilatation of the pupil and dryness of the mouth and throat. Dr. Nunnely successfully treated habitual constipation by giving $\frac{1}{6}$ to $\frac{1}{2}$ grain of Extract on rising in the morning, which rarely failed to produce a healthy stool after breakfast; and, by continuing its use for a week or fortnight, it restored the natural action of the bowels. For nocturnal incontinence of urine, dose 5 to 10 minims of the Tincture, with the same dose of Tinct. of Perchloride of Iron three times a day (*L.* '70, Oct. 22; *B.M.J.* '86, i. 291; *L.* '89, ii. 1056.) Ringer recommends larger doses of Belladonna for this troublesome complaint in children, 10 to 30 minims of the Tincture three times a day; small doses often fail when large doses at once succeed. Useful in loss of tone and irritable state of the generative organs which gives rise to nocturnal emissions, although it has slightly aphrodisiacal properties.

It is prescribed as the **Extract** in pills, and the **Tincture**, for internal use; externally, the **Liniment** and **Compound Liniment** sprinkled on piline; the **Chloroform** mixed with Oils for rubbing; and the **Glycerinum** as a paint.

**Incompatibles.**—Caustic Alkalies, Opium, Strychnine.

**Antidotes.**—In cases of poisoning by Belladonna, the antidotes are, an emetic 10 grains of Sulphate of Copper, 20 grains of Sulphate of Zinc, 1 oz. of Ipecacuanha Wine, or hypodermic injection of $\frac{1}{10}$th grain Apomorphia. Chloral Hydrat. *L.* '81, i. 74, and ii. 589. Pilocarpine, *B.M.J.* '81, i. 594. Physostigma, *B.M.J.* '81, i. 918.

## Preparations.

### EXTRACTUM BELLADONNÆ.

Take 112 lbs. of fresh leaves and young branches, bruise in a stone mortar, or suitable apparatus, and press out the juice, heat it gradually to 130° F. (54·4° C.), separate the green colouring matter by a calico filter, heat the strained liquor to 200° F. (93·3° C.) to coagulate the albumen, and again filter; evaporate the filtrate by a water-bath to the consistence of a thin syrup, then add to it the green colouring matter previously separated and passed through a hair sieve, and, stirring the whole together assiduously, continue the evaporation at a temperature not exceeding 140° F. (60° C.), until the Extract is of a suitable consistence for forming pills.

100 lbs. of herb yielded 56 lbs. of juice, or nearly 4 lbs. Extract.

100 lbs. leaves, when dried, weighed 16 lbs.

An estimation of the alkaloids contained in four samples of Extract of Belladonna, prepared in 1885 by different makers, gave ·94 p. c., 1·17 p.c., 1·11 p. c., ·73 p. c. The following samples in good condition were examined at the same time: 1880—1·26 p. c., 1·22 p. c.; 1881—1·16 p. c., 1·21 p. c.; 1884—1·21 p. c.

A sample of 1892 Extract yielded 1·7 per cent. of Alkaloids.

**Dose.**—$\frac{1}{4}$ to 1 grain.

(Austr., alcoholic from the **leaves**; Belg., clarified juice from **leaves** evaporated; Dan., made from **leaves** with weak spirit; Dutch, alcoholic from **fresh herb**; Fr., clarified juice from **leaves** evaporated, also alcoholic from the **seeds**; Ger., made with water and spirit from **leaves** and flowering branches; Hung., alcoholic from **root**; Ital., Norw. and Swed., alcoholic from **leaves**; Port., aqueous from **dried leaves,** alcoholic from **fresh herb** and alcoholic extract purified by alcohol; Russ., made from **leaves** with water and spirit; Span., clarified juice from **leaves** evaporated, and aqueous from **dried leaves**; also alcoholic from **dried leaves**; Swiss, alcoholic, 1=2 of root, also **Fluid Extract** 1 in 1; U.S., an alcoholic extract from the powder of the **leaf,** also **Fluid Extract** of the **root.**)

### SUCCUS BELLADONNÆ.

Freshly expressed juice from the fresh leaves and young branches, 3; Rectified Spirit, 1; mix; after 7 days filter. To be kept in a cool place.

**B.P. Dose.**—5 to 15 minims.

Belladonna Juice which would yield an Extract of 1 per cent. Alkaloid would form a Succus of about ·05 per cent.

### TINCTURA BELLADONNÆ.

Belladonna leaves in No. 20 powder, 1; Proof Spirit, 20: macerate forty-eight hours in 15 of the Spirit, agitating occasionally; pack in a percolator, and when it ceases to drop, add the remaining Spirit, let it drain, press the marc, filter and make up with Proof Spirit to 20.

=(1 in 20).

60 minims may be considered about equal in therapeutical strength to 1 grain of the Extract.

If good average dried leaf be reckoned at ·5 per cent., the Tincture will contain ·025 per cent., and be about half the strength of the Succus.

**B.P. Dose.**—From 5 to 20 minims.

(Dried leaves,—Austr., 1 in 10; Belg., Fr., Port. and Span., 1 in 5; Swiss, 1 in 10; U.S., 15 in 100; Russ., 1 in 12; Fresh leaves,—Belg., Fr. and Port., 1 and 1: all by weight except U.S.; not in the others.)

### Not Official.

**GLYCERINUM BELLADONNÆ.**—Extract of Belladonna, 1 oz.; Hot Water, 60 mins.; Glycerine to 2 oz.

This is practically the strength used in *London*, *Middlesex*, and *University College Hospitals*, and added to *B.P.C.* in 1891.

(Belg., Fr. and Port., 1 Extract in 10.)

Used as a pigment for relieving pain and tension in acutely inflamed parts; also painted on the breasts to suppress secretion of milk.

**SUPPOSITORIUM BELLADONNÆ.**—Extract of Belladonna, 1 grain; Cacao Butter, 15 grains, for one suppository.

The green Extract of Belladonna should be reduced with Water to the consistency of a thick syrup, then rubbed with some of the melted Cacao Butter, and the mixture then added to the remainder of the melted Cacao. In this way from one to five grains of the Extract can readily be made into a suppository.

## BELLADONNÆ RADIX.

BELLADONNA ROOT.

The dried root of *Atropa Belladonna*, from plants growing wild or cultivated in Britain; or imported in a dry state from Germany. The roots are best collected in early spring.

As in the case of Belladonna leaves, the alkaloid of the root is almost wholly Hyoscyamine. A good parcel of roots should average ·5 per cent., but occasional bales are found averaging ·7 to ·8 per cent. The best alkaloidal solvent is undoubtedly Ammoniated Spirit. 20 oz. of a particularly rich sample of powder yielded a first percolate of 20 fluid ounces containing ·75 per cent. of alkaloid, followed by a second 20 oz. of percolate of ·018 per cent. By the Dunstan process the same root yielded a total of ·69 per cent.

(Austr., Belg., Dan., Fr., Hung., Ital., Port., Russ., Span., Swed., Swiss, and U.S.; not in Dutch, Ger., or Norw.)

## Preparations.

### EMPLASTRUM BELLADONNÆ.

Alcoholic Extract of Belladonna, 1; Resin Plaster, 2; Soap Plaster, 2: melt the plasters by the aid of a water-bath, then add the Extract, and mix the whole thoroughly together. = (1 in 5).

There is a great alteration in appearance from the Brit. Pharm. 1867 Plaster; it was formerly made of the extract from the leaves.

Applied to the breasts after nursing, to check secretion of milk.

(Belg., Extract 1 in 8; Fr., Alcoholic Extract 3 in 4; Port., Alcoholic Extract 1, Lead Plaster 9; Span., Extract about 1 in 5; Swiss, Fluid Extract 3 in 10; U.S., Alcoholic Extract of Leaves 1, Resin Plaster 2, Soap Plaster 2; not in the others.)

### EXTRACTUM BELLADONNÆ ALCOHOLICUM.

Belladonna Root in No. 20 powder, 1 lb.: macerate it with 2 pints of Rectified Spirit in a closed vessel for forty-eight hours, transfer to a percolator, and when the fluid ceases to pass continue the percolation with Water until 2 pints of fluid have been collected. Evaporate the percolated liquid by a water-bath until it has acquired a suitable consistence.

Uniformity in this preparation will not be obtained till a Spirit Menstruum *only* is used; by B.P. method the last portions of Spirit are mixed with Water, which increases the yield of Extract but lowers its alkaloidal value.

Commercial specimens examined (*P.J.* xvi. 777) varied in yield of Alkaloid from 1·6 to 4·45 per cent. and again (*P.J.* xxi. 631) from 1·6 to 4·0 per cent.

**Dose.**—$\frac{1}{16}$ to $\frac{1}{4}$ grain.

Used in the preparation of Emplastrum and Unguentum Belladonnæ.

(Foreign Pharmacopœias compared under Extractum.)

### LINIMENTUM BELLADONNÆ.

Belladonna Root in No. 40 powder, 20; Camphor, 1; Rectified Spirit, a sufficiency: moisten the root for three days with 20 of the spirit, then pack in a percolator, and when the liquor ceases to pass continue the percolation with sufficient spirit to produce, with the Camphor, 30. (3 of Liniment are equal to 2 of Root).

28 lbs. (448 oz.) of Belladonna Root, in powder, was macerated and percolated until 448 fluid ounces were collected; the receiver was then removed and the percolation continued as by B.P. 1885 formula, *i.e.* until a further 224 fluid ounces were collected. The two products were then examined separately for Alkaloids, and gave ·452 per cent. in the first percolate, ·092 per cent. in the second percolate.

The Liniment of Belladonna introduced by Peter Squire was made by simple percolation of Belladonna Root in (fine) powder with Rectified Spirit, so that 1 of finished product contained 1 of Root.

A recent experiment with a Root rich in Alkaloid (·75 per cent.), percolated as above, gave ·564 per cent. in the first two-thirds, and only ·031 in the remaining third. The residual Alkaloid was easily extracted by Ammoniated Spirit.

Three commercial samples lately examined by us yielded ·176, ·21, ·22 per cent. of Crystalline Alkaloid. *See* also *P.J.* xvii. 257.

Prescribed with equal parts of Soap Liniment or Compound Camphor Liniment.

An excellent topical application for neuralgic pain. Does not mix readily with fixed oils. When an oily liniment is required, it is better to order the Chloroform of Belladonna mixed with Olive or Almond Oil.

(U.S., about 1 in 1; Span. (Aceite de Belladonna), Fresh Leaves 1, Olive Oil 2; not in the others.)

**Ethereal Tincture of Belladonna** (*Sawyer*).—Substitute Pure Ether for Rectified Spirit in the above Liniment.—*L.* '90, ii. 67.

### UNGUENTUM BELLADONNÆ.

Alcoholic Extract of Belladonna, 50 grs.; Benzoated Lard, 1 oz.: mix. =(about 1 in 10).

This ointment was formerly made with the green Extract of Belladonna and Lard, which is still preferred by some practitioners.

(Belg., Extract 1 in 10; Fr. (Pommade) Extract 4 in 30; Port. (Pomada) aqueous Extract 1, Lard 9; (Forte) Alcoholic Extract 1, Lard 9; Russ., Extract 1 in 10; Span. (Pomada) Extract 1, Lard 5; U.S., Alcoholic Extract 1 in 10; not in the others.)

### Not Official.

**CHLOROFORMUM BELLADONNÆ.**—Belladonna Root in powder, 20: percolate with sufficient Chloroform to produce 20.

Applied with equal parts of Camphor Liniment or Olive Oil, for painful rheumatism.

The lengthy process of B.P.C. might be expected to be a great improvement, on the simple method of percolating the powdered root with Chloroform, as introduced in the very first (1864) edition of "Companion," but as a matter of fact, no more alkaloid is extracted.

It is well known that this preparation only extracts about half of the total Alkaloid. By mixing the Root (in No. 40 powder) with Slaked Lime and powdered Carbonate of Ammonium, four-fifths of the Alkaloid will appear in the first 1 in 1 percolate.

**LINIMENTUM BELLADONNÆ COMP.**—Liniment of Belladonna, 7; Chloroform of Belladonna, 1: mix. Sprinkled on impermeable piline (not *spongio piline*), when applied to the loins in lumbago, should be firmly pressed with the hands on the part for five minutes to insure perfect contact, and should then be kept on at least 10 or 12 hours.

The author, who suffered much from lumbago, found this more effectual and much more convenient than Belladonna plasters.

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## BENZOINUM.

### BENZOIN.

A Balsamic Resin obtained from *Styrax Benzoin*, and probably one or more other species of *Styrax*. It is generally procured by making deep incisions in the bark of the trees, and allowing the liquid that exudes to concrete by exposure to the air.

The following are the commercial varieties:—

1. "**Siam**," the finest and most aromatic; not produced from *Styrax Benzoin.*—*P.J.* xxi. 519.
2. "**Sumatra**," exported solely from the *Western* side of the Island (Padang).
3. "**Palembang**" and "**Penang**," less valuable varieties also produced in Sumatra.

The botanical sources and causes of difference in the three Sumatra Benzoins are still undecided. Holmes is of opinion that "Penang" (the smell of which so strongly resembles Storax) must be the product of a different species. It is also said (*C.D.* '91, ii. 487) that the Palembang is invariably and systematically adulterated before exportation with other gum-resins, which may to some extent mask its individual character; but this will not account for the absence of Cinnamic Acid, which is stated to be a peculiarity quite characteristic of this variety. So it would appear that all three kinds are specifically distinct.

**Solubility.**—The tears wholly soluble 1 in 5 of Rectified Spirit; 1 in 1 of Ether; and in Solution of Potash. The mass contains impurities, which are left after treating it with Alcohol. The Solution in Spirit or Ether is acid.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span. (Benjui), Swed., Swiss and U.S.)

**Medicinal Properties.**—Stimulant, expectorant, styptic, used in making aromatic pastilles.

The Compound Tincture is given internally for chronic cough, and applied externally to indolent ulcers, cuts, or wounds.

**Dose.**—10 to 30 grs., rarely given in powder.

Used in the preparation of Acidum Benzoicum, Adeps Benzoatus, and Unguentum Cetacei.

### Preparation.

**TINCTURA BENZOINI COMPOSITA.** *N.O.Syn.*—Friar's Balsam. Traumatic Balsam.

Benzoin, 8; Prepared Storax, 6; Balsam of Tolu, 2; Socotrine Aloes, $1\frac{1}{2}$ (less $\frac{1}{40}$th);* Rectified Spirit, 68: macerate seven days, with occasional agitation, filter, and add sufficient Rectified Spirit to make 80. =(1 in 10).

**Dose.**—$\frac{1}{2}$ to 1 drm., triturated with mucilage or yolk of egg.

(Belg., Dan., Norw., Port., Swed. and U.S.; Fr., Teinture Balsamique; they vary considerably in composition and strength; not in the others.)

### Not Official.

**TINCTURA BENZOINI** (*B.P.C.*).—Benzoin in powder, 2; Rectified Spirit, 20: macerate for twenty-four hours with frequent agitation, then filter, and add sufficient Rectified Spirit, if required, to produce 20.

This is the same formula which has appeared in the "Companion" since '64, with the exception of making up to a volume, which is stated (*P.J.* xviii. 635) to be $21\frac{1}{2}$ without any addition of Spirit. The writer there recommends that the Spirit used for maceration should be reduced to 17 or 18, as has been done in the Official Tinct. Benzoini Comp., and when filtered made up to 20.

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* To be exact, 16 grains are to be taken from every $1\frac{1}{2}$ oz. of Aloes.

(Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S., 1 in 5; all by weight except U.S.)

**LOTIO BENZOINI.**—A nice lotion to protect the face from the heat of the sun is made with Tincture of Benzoin, 1; Rose Water, 40.

**UNGUENTUM BENZOINI.**—Benzoin in fine powder, 1; Adeps 4: mix intimately. Useful application for ulcers of the leg.—*L.* '87, ii. 351.

**VAPOR BENZOINI** (*T.H.*).—Compound Tincture of Benzoin, 60 minims in a pint of Water at 140° for each inhalation.

A sedative for acute inflammation of the pharynx and larynx.

Compound Tincture of Benzoin has also been found useful for influenza and catarrh by inhaling the vapour of the tincture through the nose.—*B.M.J.* '85. i. 430, 682.

**INSUFFLATIO BENZOINI** (Vigier).—Tincture of Benzoin, 1; Boracic Acid, 1; Starch Powder, 1. Mix and let the Alcohol evaporate. Used as a snuff in coryza. —*T.G.* '88, 141.

Not Official.

## BERBERIS.

Bark of the root of *Berberis vulgaris*.

It contains two alkaloids, **Berberine** $C_{20}H_{17}NO_4$, and **Oxycanthin** $C_{18}H_{19}NO_3$.

Berberine also occurs in Hydrastis Canadensis and Calumba. Its solutions are yellow, very bitter and coloured intensely red by Chlorine Water.

**Medicinal Properties.**—The **Fluid Extract** and the salts of Berberine have been used with success in intermittent fevers.—*T.G.* '86, 489.

### Preparations.

**EXTRACTUM BERBERIDIS FLUIDUM.**—Made with Proof Spirit. One fluid ounce of Extract is equal to one ounce of Bark.

**Dose.**—20 to 60 minims.

**BERBERINÆ PHOSPHAS.**—This is the most soluble salt of Berberine. Soluble 1 in 15 of Water; 1 in 9 of hot Water, but part separates out on standing; it is also thrown down as a yellow precipitate by excess of Alcohol.

**Dose.**—1 to 5 grains.

Not Official.

## BETULÆ ALBÆ OLEUM.

*Syn.*—Oleum Rusci.

A bituminous liquid obtained by destructive distillation of the wood of *Betula alba.* Russia leather derives its odour from this Oil.

The Russian variety is so distinct from either German or Dutch that it should alone be used in Pharmacy, and may be distinguished by shaking a few drops of the Oil with an ounce of Water, and filtering through a wet filter; the clear filtrate will give a pink colour with Potassium Cyanide Solution, which is intensified by addition of Ammonia. The German and Dutch Oils do not give this reaction.—*P.J.* xv. 769.

The active constituents of the Rectified Oil are probably Guaiacol and Cresol.—*P.J.* xxi. 661.

### Preparation.

**UNGUENTUM OLEI BETULÆ,** (*B.S.H.*)—Birch Tar, 5 fluid drachms; Yellow Wax, 120 grains: melt the Wax, add the Oil, and stir till cold.

Used in psoriasis and dry eczema.

*Caution.*—The use of this Ointment in eczema demands care.

## BISMUTHUM.

BISMUTH.

**Bi,** eq. 209.

In its crude state is generally impure.

The characteristic reactions of Bismuth are (1) a brownish-black precipitate from an acid solution with Sulphuretted Hydrogen, insoluble in alkaline Sulphides; (2) a white precipitate with Ammonia, insoluble in excess. This precipitate, dissolved in the smallest excess of Hydrochloric Acid, gives a copious white precipitate on dilution with water, insoluble in Tartaric Acid.

A delicate test for Bismuth in Solution is the black precipitate produced on boiling with a solution of Stannous Chloride in Caustic Potash.

## BISMUTHUM PURIFICATUM.

The Pharmacopœia gives a process for the purification of Bismuth by fusion with Cyanide of Potassium and Sulphur, and subsequently with the dried Carbonates of Potassium and Sodium.

A crystalline metal of a greyish-white colour, with a distinct roseate tinge.

Sp. g. 9·83; fuses at 507° F. (264° C.)

**Tests.**—Dissolved in a mixture of equal volumes of Nitric Acid and Distilled Water, it forms a solution which, by evaporation, yields colourless crystals that are decomposed on the addition of water, giving a white precipitate. If the mother-liquor from which the crystals have been separated be evaporated with Hydrochloric Acid until all the Nitric Acid is dissipated, a little of the product yields no evidence of Arsenium on being examined by the Hydrogen test, commonly known as Marsh's Test; no blue colouration on adding Water and excess of Ammonia (Copper), and no precipitate on filtering and saturating the ammoniacal filtrate with Nitric Acid (Silver); no white precipitate with Diluted Sulphuric Acid (Lead); no red or black precipitate with Sulphite of Sodium (Tellurium and Selenium); and no blue precipitate with Ferrocyanide of Potassium (Iron).

In reference to the Arsenic test described above, it has been pointed out (*P.J.* xvi. 434) that, supposing Arsenic to be present in the Bismuth, the bulk of it will remain behind as an insoluble Arseniate of Bismuth and the balance be volatilised during the subsequent evaporation with Hydrochloric Acid.

Commercially Bismuth Salts are practically pure, except for traces of Lead.—*P.J.* xviii. 679.

Traces of Lead might escape detection by the Sulphuric Acid test.

Employed for the preparations of Bismuth.

(Belg., Dutch, Fr., Ital., Port., Span. and Swed.; not in the others.)

## BISMUTHI CARBONAS.

CARBONATE OF BISMUTH.

*B.P.Syn.*—OXYCARBONATE OF BISMUTH.

$(Bi_2O_2CO_3)_2$, $H_2O$, eq. 1038.

A white powder, prepared by dissolving Purified Bismuth in Nitric Acid, and precipitating with Carbonate of Ammonium.

Soluble with effervescence in Nitric Acid; insoluble in Water. It varies much in density; the lighter variety is most suited for dispensing, being more easily suspended.

**Tests.**—It is blackened by Sulphuretted Hydrogen. If to Nitric Acid, mixed with half its volume of Distilled Water, as much Carbonate of Bismuth be added as the Acid will dissolve, one volume of this solution poured into 20 volumes of Water will yield a white precipitate. The Nitric Acid solution gives no precipitate or becomes only slightly turbid with Solution of Nitrate of Silver (indicating absence of Chlorides). It should also stand the tests described under "Purified Bismuth."

When added to Sulphuric Acid, coloured with Sulphate of Indigo, the colour of the latter is not discharged, unless a relatively very minute proportion of the Indigo Solution be used (indicating absence of Nitrates).

The commercial Carbonate invariably contains more than a trace of Nitrate, and therefore will not pass this test.—*P.J.* xiii. 936; xviii. 721, 780.

(Port. and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Similar to the Subnitrate, and often preferred to it.

**Dose.**—5 to 20 grains.

The following prescription is a good one for pyrosis:—

Bismuthi Carbonatis, 2 drms.; Magnes. Carb. Levis, 1 drm.; Pulv. Tragac. Comp. 2 drms; Aq. Flor. Aurant., Glycerini, āā 2 drms.; Aquæ ad 6 oz.

3 to 4 teaspoonfuls 3 times a day after meals.

Mucilage of Acacia is not a good vehicle for Bismuth; it settles as a hard mass in the bottle, which is difficult to diffuse.

## BISMUTHI CITRAS.

CITRATE OF BISMUTH.

$BiC_6H_5O_7$, eq. 398.

A white powder, usually containing 2½ per cent. of absorbed moisture.

The Official process for preparing this is generally acknowledged to be a failure. In the new edition it will probably be replaced by one on the lines indicated by MacEwan, *P.J.* xvi. 602. In any case the Nitric Acid should be cut down to half.

**Solubility.**—Insoluble in Water; readily in Solution of Ammonia.

**Tests.**—Its solution in Ammonia gives with Sulphuretted Hydrogen a black precipitate (Sulphide of Bismuth), and the filtrate from this, after it has been boiled until free of Ammonia, and then filtered, gives a white precipitate (Citrate of Calcium) when warmed with Lime Water; the filtrate also affords no black colour round a crystal of Sulphate of Iron added together with an equal bulk of Sulphuric Acid (Nitrate). On strongly heating Citrate of Bismuth it chars, and on ignition yields a residue for the most part black* but with a yellow surface, soluble in a little Nitric Acid. The latter solution on being dropped into Water affords a white precipitate *; and the solution should also stand the tests described under "Purified Bismuth." 10 grains dissolved in Solution of Ammonia and treated with Sulphuretted Hydrogen in excess yields a precipitate which, when well washed and dried, weighs about 7 grains.

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* The colour on ignition, approaches more nearly to a yellowish green.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Similar to the Subnitrate.

**Dose.**—2 to 5 grains.

### Preparations.

**LIQUOR BISMUTHI ET AMMONII CITRATIS.** *B.P.Syn.*—Liquor Bismuthi.

Rub Citrate of Bismuth, 800 grains, to a paste with a little Distilled Water; add Solution of Ammonia gradually and with stirring until the salt is just dissolved; dilute with Distilled Water to measure 20 oz.

The point to be noted in regard to the addition of Ammonia is, that even after the whole of the Citrate of Bismuth has gone into solution, the *equivalent* of Ammonia has not yet been added. It requires from $\frac{1}{4}$ to $\frac{1}{3}$ more Ammonia before even the slightest smell is perceptible, and if (in working with the Official quantities) sufficient Ammonia be added to make the liquid (when measuring 10 oz.) smell distinctly, and then dilute with Distilled Water to make the fluid 20 oz., we find neither deposit nor growth to occur.

The quantity of Ammonia (sp. g. ·959), usually necessary to "just dissolve" is about 11 fluid drachms and an extra 3 fluid drachms to make it smell distinctly.

A colourless solution, neutral or alkaline to test-paper, which is miscible with Water.

**Tests.**—Sp. g. 1·07. Two fluid drachms mixed with an ounce of Distilled Water and treated with Sulphuretted Hydrogen in excess yields a black precipitate which, when washed and dried, weighs about 7 grains. Evaporated to dryness and the residue ignited, a charred mass with a yellow edge results; this treated with Nitric Acid affords a solution which should stand the tests described under "Purified Bismuth."

One fluid drachm contains an amount of Bismuth equivalent to about 3 grains of Oxide of Bismuth.

**Dose.**—30 to 60 minims.

**BISMUTHI ET AMMONII CITRAS.**

Evaporate Solution of Citrate of Bismuth and Ammonium over a water-bath to the consistence of a syrup; spread the resulting fluid in thin layers on glass or porcelain plates and dry at a temperature not exceeding 100° F. (37·8° C.). Remove the scales and preserve them in a stoppered bottle.

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* This reaction is rendered more delicate by first adding a slight excess of Ammonia to the Nitric Acid solution, and redissolving the precipitate in a small quantity of Hydrochloric Acid. This, on being poured into Water, gives a white precipitate, which is insoluble in Tartaric Acid, and is thus distinguished from an Antimony precipitate.

Small shining translucent scales, which yield Ammonia when warmed with solution of a fixed alkali.

Of course in making this preparation the dilute Liquor would not be used, but simply the Citrate rubbed to a paste with Water and cleared with a slight excess of Ammonia.

**Solubility.**—1 in 1 of Water; sparingly in Rectified Spirit.

**Tests.**—10 grains dissolved in Water and treated with Sulphuretted Hydrogen in excess yields a precipitate which, when washed and dried, weighs about 6½ grains. On ignition it should stand the tests given under "Citrate of Bismuth."

**Dose.**—2 to 5 grains.

(U.S.; not in the other Pharmacopœias.)

Not Official.

## BISMUTHI NITRAS.

$Bi(NO_3)_3$, eq. 395.

In colourless transparent crystals. Decomposed by Water, giving a white precipitate of Subnitrate. Soluble in Glycerine, but is slowly deposited from the solution when Water is added.

A **glycerole** can be made containing 60 grains to the ounce, but as an outward application in skin diseases the strength should in most cases not exceed 10 grains to the ounce.—*M.T.* '76, ii. 646.

The salt should be dissolved cold; heat should not be applied.

### Preparation.

**BISMUTHI OLEAS.**—Crystallised Nitrate of Bismuth, 280 grs.; dissolve cold in Glycerine 4 oz. by weight; add slowly Solution of Oleate of Sodium, 20 oz.; warm gently, wash by decantation, collect, and dry.

It forms a pearly grey soft bland substance.

**Medicinal Properties.**—It is a reliable application in pustular eruptions and hyperæmia of the skin.—*B.M.J.* '84 ii. 751.

## BISMUTHI OXIDUM.

OXIDE OF BISMUTH.

$Bi_2O_3$, eq. 466.

A dull lemon-yellow powder obtained according to the Official process by decomposing the Subnitrate with Solution of Soda at the boiling temperature.

Introduced into the '74 Official Appendix, probably with the view of making Liquor Bismuthi et Ammonii Citratis on the lines of Wood's process given *P.J.* ii. 233.

**Solubility.**—Insoluble in Water; soluble in Nitric Acid mixed with half its volume of Water.

**Tests.**—The Nitric Acid solution gives no precipitate or becomes only slightly turbid with solution of Nitrate of Silver—indicating absence or only a trace of chlorides; it stands the tests for impurities described under "Purified Bismuth." Heated to incipient redness it is not diminished in weight (absence of moisture and Carbonic Acid).

**Dose.**—5 to 15 grains.

(Not in the other Pharmacopœias.)

### Not Official.

**BISMUTHI OXIDUM HYDRATUM.**—A white amorphous powder, soluble in an excess of Hydrochloric Acid and precipitated again on the addition of Water as Oxychloride. It mixes readily with Water to form a cream.

**CREMOR BISMUTHI.**—Hydrated Oxide of Bismuth, 1; Water, 4: rub together till smooth.

**BISMUTHI SALICYLAS.**—Commercially the composition is very variable; it may contain 35 to 73 per cent. of Bismuthous Oxide.—*P.J.* xv. 889.

(Russ., 63 per cent.)

**Tests.**—The true salt does not yield more than a trace of Salicylic Acid when treated with Chloroform.

**Medicinal Properties.**—Has been given with success in gastro-enteric affections, particularly those of children.—*L.* '86, ii. 31, 1229; *T.G.* '86, 775; *L.* '88 i. 191, 1100.

**Dose.**—5 to 20 grains, prescribed in Water, with Glycerine or Syrup.

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# BISMUTHI SUBNITRAS.

## SUBNITRATE OF BISMUTH.

*B.P.Syn.*—Oxynitrate of Bismuth.

*N.O.Syn.*—White Bismuth, Magistery of Bismuth.

**$BiONO_3, H_2O$, eq. 305.**

The formula calculates into 77 per cent. of Oxide, but it always contains 79 to 82 per cent.; if the compound $BiONO_3, H_2O$ exists, it is so unstable that it could certainly not be kept without decomposition.—*C.D.* '85, 561.

A heavy white powder in minute crystalline scales, blackened by Sulphuretted Hydrogen.

**Solubility.**—Insoluble in Water.

**Tests.**—It forms with Sulphuric Acid diluted with an equal bulk of Water a solution which is blackened by Sulphate of Iron (Nitrate). The Nitric Acid solution gives only a faint opalescence with a very small proportion of Hydrochloric Acid (Silver), with solution of Nitrate of Silver remains clear or becomes only slightly turbid (absence or trace of Chlorides), and stands the tests for impurities described under "Purified Bismuth." If 10 grs. be dissolved in Nitric Acid, and the fluid be mixed with a solution of about 20 grs. of Citric Acid and sufficient Ammonia to give decided alkalinity, the mixture then being boiled while still kept faintly alkaline, no precipitate or opalescence is observable (Calcium Phosphate).

The best Arsenic test is to dissolve the sample in pure Hydrochloric Acid, add Arsenic-free Zinc, and cover the test-tube with filter-paper moistened with solution of Bichloride of Mercury or Nitrate of Silver.—*P.J.* xiv. 424.

It is distinguished from the Carbonate by being soluble without effervescence in diluted Nitric Acid and from the Oxychloride by dissolving in Acetic Acid

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—It is highly useful in pyrosis, some forms of vomiting and irritative dyspepsia; also in diarrhœa; like Iron it blackens the excretions. It is recommended to be injected in gonorrhœa, 60 grains to the ounce of Water; the Bismuth is mixed with an equal quantity of Glycerine or suspended with Tragacanth: writers differ as to whether it is better in the acute or chronic stage. When prescribed in a **mixture**, it should be suspended with Compound Powder of Tragacanth, 1½ drachms in a 6-oz. mixture.

As Subnitrate of Bismuth in Water slowly parts with its Nitric Acid, the mixture is always acid, and this somewhat interferes with its suspension, and when prescribed with Bicarbonate of Sodium it causes a slight but steady evolution of Carbonic Acid; these objections do not apply to the Carbonate of Bismuth, which is therefore preferred in mixtures.

Externally it is used as a cosmetic, but is more or less blackened by an impure atmosphere; and in lotion for some chronic skin diseases.

Has been recommended as a dressing for wounds (*L.* '85, ii. 634, and *T.G.* '85, 266). A case of poisoning from the above use of it (*B.M.J.* '87, i. 749).

**Dose.**—5 to 20 grains.

**Incompatibles.**—Effervescence ensues if prescribed in Water with Alkaline Bicarbonates. With Iodide of Potassium double decomposition slowly ensues.

## Preparation.

### TROCHISCI BISMUTHI.

Lozenges prepared with Subnitrate of Bismuth, Carbonate of Magnesium, Precipitated Carbonate of Calcium, Sugar, Gum Acacia, and Rose Water.

Each lozenge contains 2 grains of Subnitrate of Bismuth.

**Dose.**—1 to 6 lozenges.

A modification of this lozenge has been recommended by Sir W. Roberts, omitting the Bismuth and adding Chloride of Sodium.—*B.M.J.* '89, ii. 374.

It is known as the **Gastric Antacid Lozenge.**

(Fr. and Port. 1½ gr. in each; not in the other Pharmacopœias.)

## Not Official.

**LOTIO BISMUTHI** (*B.S.H.*).—Subnitrate of Bismuth, 10 grs.; Water, 1 oz.: mix. Used as a sedative lotion in cases of eczema.

**UNGUENTUM BISMUTHI.**—Subnitrate of Bismuth, 60 grs.; Lard, 1 oz.

**FERRIER'S SNUFF.**—Subnitrate of Bismuth, 6 drms.; Hydrochlorate of Morphine, 2 grs.; Gum Acacia in powder, 2 drms.—*L.* '76, i. 525.

It is described as a speedy and efficacious remedy for a recent cold in the head; each time the nostrils are cleared another pinch should be taken, using it frequently at first. One quarter to one half of this formula may be used in the twenty-four hours.

Glass insufflators are made to blow it up the nostrils.

**BISMUTHI SUBGALLAS.**—A light yellow insoluble powder, introduced as an odourless substitute for Iodoform, under the name **Dermatol.**

**BISMUTHI SUBIODIDUM.**—A brick-red amorphous powder, insoluble in Water. Has been recommended as a substitute for Iodoform in the treatment of chancres and foul ulcers.—*T.G.* '87, 612; *Y.B.P.* '87, 286.

Not Official.

## BOLDO.

The leaves and young twigs of the *Peumus fragrans*, a native of Chili.

The activity is due to a glucoside, Boldine, and a volatile oil (sp. g. ·918).

(Fr. and Span.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been used in liver complaints, and as a stimulant to digestion, also as a hypnotic.

Boldine has been given as a hypnotic in **capsules** containing 3 grains.

### Preparation.

**TINCTURA BOLDO.**—Boldo Leaves, 1; Proof Spirit, 10.

Digest seven days and filter.

**Dose.**—10 to 40 mins.

(Fr., 1 and 5, by weight; not in the other Pharmacopœias.)

## BORAX.

BORAX.

*B.P.Syn.*—Sodæ Biboras; Pyroborate of Sodium.

$Na_2B_4O_7, 10H_2O$, eq. 382.

A salt imported in a crude state from India; large quantities are also manufactured from the native Boric Acid of Tuscany, and the native Borate of Calcium of Peru.

In transparent colourless crystals, sometimes slightly effloresced, with a weak alkaline reaction.

**Solubility.**—1 in 22 of Water; 2 in 1 of boiling Water; 2 ounces of Borax are dissolved by 2 ounces of Glycerine, and the solution measures only 3¼ ounces. By the aid of 1 of Glycerine, 1 part of Borax will dissolve in 12 of Water. Insoluble in Rectified Spirit.

**Tests.**—A hot saturated solution, when acidulated with any of the Mineral Acids, lets fall as it cools a scaly crystalline deposit (Boric Acid), a solution of which in spirit burns with a green flame. 191 grains dissolved in 10 fluid ounces of Distilled Water require for saturation 1000 grain-measures of the volumetric solution of Oxalic Acid.

Although Borax is really an acid salt, Boric Acid has so little action upon the usual indicators, that the Soda can be estimated by standard Acid just as if no Boric Acid was present.

Phenol-phthalein is of no use for this titration, and even Litmus gives a rather indefinite end-reaction. The best results are obtained with Methyl-orange and standard Sulphuric Acid.—*Sutton.*

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Antiseptic and mildly astringent. A local sedative to inflamed mucous membrane. As a **lotion** 10 grains to the ounce; as a **gargle** (saturated solution) about 20 grains to the ounce. The Glycerine of Borax is used as a **paint** for the throat.

**Dose.**—5 to 40 grains.

**Incompatibles.**—Mineral Acids and most of their Metallic Salts. Mucilage of Acacia.

### Preparations.

**GLYCERINUM BORACIS.**

Borax in powder, 1; Glycerine, 4; Distilled Water, 2; rub together and heat in a water-bath until the Borax is dissolved.

=(By weight 1 in 8, measure 1 in $6\frac{3}{4}$).

It is more dilute than formerly, the Water being an addition. The 1867 preparation, made without Water, is more viscid, and on that account is preferred as an application by some physicians.

This is not merely a solution of Borax in Glycerine; the Glycerine splits up the Biborate into free Boric Acid and a more basic Borate with secondary reactions. It reddens Litmus paper, and effervesces on the addition of Bicarbonate of Sodium.

**Dose.**—$\frac{1}{2}$ to $1\frac{1}{2}$ drachms.

20 mins. given in diarrhœa of infants.—*L.* '89, ii. 739.

(Dutch, 1 and 5 (by weight); not in the other Pharmacopœias; U.S., Glyceritum Boroglycerini, with Boric Acid.)

**MEL BORACIS.**

Finely powdered Borax, 2; Glycerine (by weight), 1; Clarified Honey, 16: mix. =(about 1 in 7 by volume).

(Norw. and Swed. (Linctus), 1 in 10; Swiss, 1 in 10; the ingredients vary slightly. Not in the other Pharmacopœias.)

Applied to aphthæ of the mouth.

### Not Official.

**LOTIO BORACIS.**—Borax, 1; Rose Water, 24; or Borax 1, Glycerine 1, Rose Water 16.

Used as a cosmetic.

**TINCTURA MYRRHÆ ET BORACIS.**—Myrrh, 1; Eau de Cologne, 16; Borax, 1; Water, 3; Syrup, 3.

For the teeth and gums.

**UNGUENTUM BORACIS.**—Borax, 1; Simple Ointment, 8.

For chilblains or cracked nipples.

## BROMUM.

BROMINE.

**Br, eq. 80.**

A liquid non-metallic element, obtained from sea-water and from some saline springs.

A dark brownish-red, very volatile liquid, which gives off red suffocating vapours at the ordinary temperature of the air. Sp. g. 2·97 to 3·14; boils at 135° to 145° F. (57·2° to 62·8° C.).

**Solubility.**—In Water, 1 in 30 by weight. Readily soluble in Glycerine, Alcohol, Ether, Chloroform, and Bisulphide of Carbon with gradual decomposition of the solvents.

**Test.**—Agitated with solution of Soda in such proportion that the fluid remains very slightly alkaline it forms a colourless liquid which, if coloured by the further addition of a small quantity of the Bromine, does not become blue on the subsequent addition of a cold solution of Starch (absence of Iodine).

Chlorine is the impurity most likely to be present in Bromine; both U.S. and Ger. allow 3 per cent. of Chloride in their alkaline Bromides.

(Belg., Fr., Ger., Ital., Port., Russ., Span., Swiss and U.S.; not in Austr., Dan., Dutch, Hung., Norw. or Swed.)

**Medicinal Properties.** — Deodoriser and disinfectant. Used medicinally as a sedative in the form of the Bromides and Dilute Hydrobromic Acid.

Used to prepare Acidum Hydrobromicum Dilutum, Potassii Bromidum, and Sodii Bromidum.

**ACIDUM HYDROBROMICUM DILUTUM,** *see* p. 25.

### Not Official.

**HYPOBROMITE SOLUTION FOR UREA-ESTIMATION.**—Prepare a stock Solution of Soda (sp. g. 1·310) by dissolving 3½ oz. of pure Hydrate of Sodium in 9 oz. of Water. To one ounce of this add 42 mins. of Bromine when the Solution is wanted for use.

Glass tubes (hermetically sealed) containing the proper quantity of Bromine are also made.

**LIQUOR BROMI.**—Bromine, 160 mins.; Bromide of Potassium, 240 grs.; Water, 4 oz.: dissolve the Bromide of Potassium in the Water in a bottle, add the Bromine and shake till dissolved.

**BROMOFORM** ($CHBr_3$).—A colourless liquid, about twice as heavy as Chloroform, practically insoluble in Water, readily soluble in Rectified Spirit and Ether.

It becomes yellow on exposure to sunlight, and should not then be dispensed.

Given for the relief of whooping cough in doses of 2 to 5 drops three or four times a day; in some cases it caused languor and drowsiness, and an over-dose produced toxic symptoms.—*L.* '90, ii. 139; '93, i. 1062; *Pr.* xlv. 47; *T.G.* '90, 694; '91, 214.

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### Not Official.

## BRYONIA.

The root of *Bryonia alba* and of *Bryonia dioica.*

(Belg., Fr., Port., Span. and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—In large doses it is an active hydragogue cathartic, in small doses it is given in pleurisy. It has also been used as a styptic in menorrhagia.—*L.* '88, ii. 438.

It has been used for many years by the homœopaths in the form of tincture.

The active principle is a glucoside.

### Preparation.

**TINCTURA BRYONIÆ** (*B.P.C.*)—Ascertain the percentage of moisture in the fresh Bryony Root by drying 100 grains over a water-bath. Bruise the remainder, after having calculated the Water it contains, and reckon this as a part of the Water to form, with Rectified Spirit, a mixture equal in strength to Proof Spirit.

Produce a tincture, by macerating for seven days, of such a strength that 10 oz. shall represent 1 oz. of the dried root.

Fresh Bryony Root yields on an average 32 to 40 per cent. of dried root.

**Dose.**—1 to 10 minims.

(U.S., 1 dried root in 10; Fr. (Alcoolature), 1 fresh root in 1.)

**Antidotes.**—Emetic; stimulants, Brandy or Spirit of Sal Volatile.

## BUCHU FOLIA.

### BUCHU LEAVES.

*N.O.Syn.*—Bucco; Diosma.

The dried leaves of *Barosma betulina*, *B. crenulata*, *B. serratifolia*.

There is not much difference between them, but of the three varieties *B. betulina* is the richest and *B. serratifolia* the poorest in Volatile Oil, Resins and Mucilage.—*P.J.* xxi. 420.

The short-leaved variety (*betulina*) is now the only one commercially obtainable.

(Belg. (Diosma), Dan., Dutch, Fr., Norw., Port., Span., Swed. and U.S.; not in Austr., Ger., Hung., Ital., Russ. or Swiss.)

**Medicinal Properties.**—Tonic, stomachic, diuretic, and diaphoretic. Given chiefly in complaints of the urinary organs, as irritation of the bladder and urethra, diseases of the prostate, and retention or incontinence of urine. Also in dyspepsia, chronic rheumatism, cutaneous affections, and dropsy.

**Dose.**—20 to 40 grains in powder.

### Preparations.

**INFUSUM BUCHU.**

Buchu leaves bruised, 1; boiling Distilled Water, 20: infuse for half an hour and strain. =(1 in 20).

**Dose.**—1 to 4 oz.

(Not in the other Pharmacopœias.)

**TINCTURA BUCHU.**

Buchu leaves in No. 20 powder, 1; Proof Spirit, 8: macerate for forty-eight hours with $\frac{3}{4}$ of the Spirit, with occasional agitation, pack in a percolator, and let it drain, then pour on the rest of the Spirit; when it ceases to drop, press the marc, filter, and make up with Proof Spirit to 8. =(1 in 8).

**Dose.**—1 to 2 drachms.

(Fr., 1 and 5, by weight; not in the other Pharmacopœias.)

## BUTYL-CHLORAL HYDRAS.

### HYDRATE OF BUTYL-CHLORAL.

*B.P.Syn.*—Croton-Chloral Hydrate, wrongly so called.

$C_4H_5Cl_3O, H_2O$, eq. 193·5.

Butyl-Chloral, produced by the action of dry Chlorine Gas on Aldehyde cooled to 14° F. (—10° C.); separated by fractional distillation, and converted into the solid Hydrous Butyl-Chloral by the addition of Water.

White crystalline scales, which should have a pungent but not an acid odour, resembling that of Hydrous Chloral, and an acrid nauseous taste.

Some samples are acid, very pungent and acrid. Of these we found that 1 gramme heated in a porcelain capsule over a water-bath for 10 minutes wholly volatilised; but after having been washed with about twice its weight of water, pressed, and dried by exposure to air, the sample lost its pungency and acridity, and when heated as above lost less than half its weight.

The slow volatility of a sample may therefore be taken as a test of its purity.

An acrid sample by washing and drying had its melting point raised from 165° to 174° F.

**Solubility.**—1 in 44 of Water; 1 in 1 of Glycerine (very slowly); 5 in 3 of Rectified Spirit; 1 in 20 of Olive Oil.

B.P. states that it is nearly insoluble in Chloroform, but we find that it practically all dissolves 1 in 20 of Chloroform, and 1 in 2 of Ether.

**Tests.**—Fuses about 172° F. (77·8° C.) to a transparent liquid, which on cooling commences to solidify at about 160° F. (71·1° C.). It does not yield Chloroform when heated with solutions of Potash or Soda or with Milk of Lime. The aqueous solution is neutral or but slightly acid to Litmus paper.

As the Hydrate loses Water even at temperatures lower than its melting point, and fuses in consequence more easily, the **melting point** should be taken quickly on a sample which has not been previously heated.—*P.J.* xvii. 797

(Dan.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Is an efficient remedy in pure neuralgia of the face and head, but is useless when the pain arises from decayed teeth. It relieves dyspnœa of spasmodic asthma and irritative cough of phthisis or of chronic laryngitis.

**B.P. Dose.**—5 to 15 grains.

**Antidote.**—Picrotoxin $\frac{1}{20}$ grain.

### Not Official.

**MISTURA CROTON-CHLORAL.**—Butyl-Chloral Hydrate, 4 grs.; Glycerine, 15 mins.; Chloroform Water, $\frac{1}{2}$ oz.; Water to 1 oz.—*London Hospital.*

**PILULA CROTON-CHLORAL.**—Butyl-Chloral Hydrate, 4 grs.; Compound Powder of Tragacanth, 1 gr.; Water q. s.; in one pill.—*London Hospital.*

**SYRUPUS BUTYL-CHLORAL** (*B.P.C.*)—Butyl-Chloral Hydrate, 320 grs.; Syrup sufficient to make 20 oz.; dissolve in the Syrup warm.

**Dose.**—1 to 4 fluid drachms.

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### Not Official.

## BYNE. MALT.

### Preparation.

**EXTRACTUM BYNES.** *Syn.*—Extractum Malti. MALT EXTRACT.

Is made by infusing or mashing ground Malt in Water at a temperature under 160° F., preferably 140° F., filtering and evaporating the solution in vacuo to the consistence of a thick syrup. It is a more convenient preparation for use when it is evaporated only to a thin syrup, but the Extract is more liable to undergo fermentation under these circumstances.

In addition to the nutrient value which Malt Extract possesses, as representing a cooked and " digested " farinaceous food, it has also been valued for its diastasic activity, or power of converting further quantities of starchy material into Dextrin and Maltose. So far as artificial digestion, or conversion previous to the act of feeding, is concerned, it *has* this value; but as the action of Malt-diastase is greatly retarded by a very slight acidity, it is very open to question whether its action can continue in the presence of normal gastric juice, and more especially in the presence of Pepsin.

It is, however, very useful when mixed with baked wheaten flour to form foods for infants and invalids when a certain amount of pre-digestion is required.

Good Malted Barley is tolerably uniform in diastase, and the widely differing results published from time to time by different analysts as to the strength of commercial Extracts must arise partly from a destruction of diastase in the manufacture of the Extracts, and partly from an ambiguity attaching to the phrase " conversion of Starch.'' Hence we find it stated on the one hand that one part of Starch requires for conversion 19 of Malt Extract, and on the other hand that one of Malt Extract will convert 30 parts of Starch.

When Starch is boiled with water it forms a semi-gelatinous fluid, which under the influence of Diastase quickly loses this condition and becomes thin and transparent, yet continues to give a blue colour with Iodine. As the action proceeds this " soluble starch " is converted into Erythro-dextrin, giving a red colour with Iodine, and finally into Acroodextrin and Maltose, neither of which is coloured by Iodine. These changes are gradual and merge one into the other, but from an analytical point of view they may be said to be complete when no shade of *red* appears on the addition of a few drops of dilute Iodine Solution, as this is the best defined point in the series of changes.

We have lately had occasion to examine a number of high-class barley-Malts, both from British and foreign grain. At a temperature of 99°—100° F. the finest sample, when treated with its own weight of Starch ceased to give any *red* colour at the end of three minutes, and the poorest sample in fifteen minutes. A well-prepared Extract should be but little if at all inferior in diastasic power to the Malt from which it is made.

It has been suggested by Helbing (Dec. '92), as a pharmacopœial standard, that the Starch Solution should not give any *blue* colouration after digestion for fifteen minutes at 104°—107° F.

From the results given in the preceding paragraph it will be seen that as a standard this is very low.

It is stated (*P.J.* xx. 481) that potato or arrowroot Starch ought always to be used in quantitative experiments of this kind, in preference to wheat and other Starches. With a knowledge of this fact, *potato* Starch was specified in our '86 edition.

The U.S.P. 1882, ordered the Malt to be macerated in cold Water for six hours, then digested for an hour at 131° F., strained and evaporated at a temperature not exceeding 131° F. to the consistence of Honey. This contains active Diastase. It has been omitted in U.S. 1893.

German Pharmacopœia gave a process for Extractum Malti in 1872, in which the infusion was *boiled* before evaporation. Of course, in this case, the whole of the Diastase is destroyed, and the process was omitted in P.G. 1882.

**Medicinal Properties.**—Malt Extract is prescribed in wasting diseases, and where the digestion is weak. It is also used to emulsify or dissolve Cod Liver Oil.

**Dose.**—A teaspoonful to a tablespoonful.

## CADINUM OLEUM.

### OIL OF CADE.

*B.P.Syn.*—"HUILE DE CADE"; JUNIPER TAR OIL.

An empyreumatic oily liquid obtained by the destructive distillation of the woody portions of *Juniperus Oxycedrus* and some other species.

Now inserted in the Official "additions" to B.P.; it has appeared as a "Not Official" in "Companion" since '67.

A dark reddish-brown or nearly black more or less viscid oily liquid. The filtered aqueous solution is almost colourless and possesses an acid reaction.

Of a sample examined by us (sp. g. ·996), the acidity amounted to ·7 per cent. pure Acetic Acid.

Sp. g. about ·99.

**Solubility.**—Mixes in all proportions with Chloroform and Ether; partially soluble in Rectified Spirit; slightly soluble in Water.

(Austr., Belg., Dan., Fr., Hung., Norw., Port., Span. (Aceite de Enebro), Swed., Swiss, and U.S.; not in the others.)

**Medicinal Properties.**—Used as a stimulant in cases of psoriasis and of chronic eczema.

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## CAFFEINA.

### CAFFEINE.

*B.P.Syn.*—CAFFEIA; THEINA; GUARANINA.

COFFEINA in some of the foreign Pharmacopœias.

$C_8H_{10}N_4O_2, H_2O$, eq. 212.

An alkaloid, usually obtained from the dried leaves of *Camellia thea*, or the dried seeds of *Coffea Arabica*, by evaporating aqueous infusions from which astringent and colouring matters have been removed.

Colourless, silky, inodorous, acicular crystals.

At 212° F. (100° C.) the Crystals lose 8·49 per cent. of their weight, and at a higher temperature melt and volatilise without decomposition.

Although 8·49 is the theoretical percentage of Water, commercial Caffeine generally contains about 7 per cent. Anhydrous Caffeine melts at about 232° C.

The quantities yielded are about as follows: Tea Leaves 3 per cent., Coffee Seeds 1 per cent., Guarana 5 per cent., Paraguay Tea 0·5 per cent., Kola Nut 3 per cent. Some physicians have suspected physiological differences in the alkaloids obtained from the different botanical sources.

The latest information regarding the extraction of alkaloid from Tea Leaves is contained in a B.P. Conference paper ('92), and the discussion following it.—*P.J.* xxiii. 213.

**Solubility.**—1 in 68 of Water; 1 in 40 of Rectified Spirit; 1 in 7 of Chloroform; 1 in 400 of Ether; 1 in 1 of Boiling Water.

**Tests.**—Its aqueous solution is neutral to Litmus. Treated with a crystal of Chlorate of Potassium and a few drops of Hydrochloric Acid, and the mixture evaporated to dryness in a porcelain dish, a reddish residue results, which becomes purple when moistened with Ammonia.

In an aqueous solution of the alkaloid, Tannic Acid gives a white precipitate soluble in excess of the re-agent.

Caffeine gives no alkaloidal reaction with either Iodine in Iodide of Potassium or Mayer's re-agent, but may be completely shaken out with Chloroform from a slightly acid or slightly ammoniacal solution.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., Swed., Swiss and U.S.; not in Norw.)

**Medicinal Properties.**—A valuable heart tonic and diuretic. Given in 2 or 3 grain doses three or four times a day (a French physician gave as much as 2 grammes in the course of one day). Its action differs from Digitalis in that it is much more rapid and entirely free from cumulative action. It should not be taken towards night for fear of causing sleeplessness.—*L.* '85, i. 188, 235, 322.

Given in 1 gr. doses every hour for sick headache; also in the form of **Granular Effervescing Citrate of Caffeine** containing 1 grain in each drachm.

**Dose.**—1 to 5 grains in solution or in pill, or more as required.

Ph. Ger. maximum single dose has been raised in latest edition from 3 to 7½ grains.

### Preparation.

**CAFFEINÆ CITRAS.**

Dissolve Citric Acid 1, in Distilled Water 2, and stir Caffeine 1, into the heated solution; evaporate to dryness on a water bath, constantly stirring towards the end of the operation. Reduce to fine powder.

A white inodorous powder with an acid reaction on Litmus.

Lloyd stated (New Remedies '81, 38) that he was unable to obtain from aqueous or alcoholic solutions a Citrate of Caffeine from which the alkaloid could not be dissolved by Chloroform, and it has lately been re-asserted (*P.J.* xxiii. 219) that the B.P. Citrate is only a mixture; but (as stated in our last edition) we find that, on boiling the product of the B.P. process with Chloroform, scarcely anything is extracted. The Citric Acid and Caffeine may therefore be assumed to be in chemical combination; but as, on the addition of Water, the salt is decomposed with liberation of free Caffeine, the solubility of which is scarcely affected by the Citric Acid, the advantage of the combination is not obvious.

**Solubility.**—1 in 32 of Water; 1 in 22 of Rectified Spirit; 1 in 10 of a mixture of 2 parts Chloroform and 1 part Rectified Spirit.

The low figure (1 in 10 of Water) given in the B.P. and in the "Companion" 1886, probably arose from the readiness with which Caffeine Citrate forms supersaturated solutions. The salt readily dissolves in 12 parts of Water at 95° F., and if the solution be heated to 120° F. and then set aside, no crystallisation will take place, even when cooled below 60° F.; but if the liquid be then stirred it will become solid almost immediately.

**Dose.**—2 to 10 grains.

(Hung., Span., Swiss and U.S.; not in the other Pharmacopœias; U.S. has also the Effervescing Citrate.)

### Not Official.

**CAFFEINÆ HYDROBROMAS.**—The "commercial article" sold under this name used to be nothing more than Caffeine with about 1 per cent. of Hydrobromic Acid. It is now obtainable in translucent masses having the composition $C_8H_{10}N_4O_2HBr\ 2H_2O$, containing 68 per cent. of Hydrated Caffeine. Being a crystallisable salt of definite composition, it has been recommended (*P.J.* xxiii. 220) as superior to the B.P. Citrate, but as it is instantly decomposed into free Caffeine and Hydrobromic Acid on contact with Water, it has obviously no advantage over the Citrate in this respect.

**Solubility.**—1 in 52 of Water.

**Dose.**—1 to 4 grains.

It is also prescribed as **Granular Effervescing Hydrobromate of Caffeine** containing 1 grain of the Hydrobromate in each drachm.

**CAFFEINE IODIDES.**—There are three well-defined compounds containing Iodine and Caffeine. (1) The normal Hydriodate, $C_8H_{10}N_4O_2.HI$, forming almost colourless crystals, decomposed by Water into free Caffeine and Hydriodic Acid. (2) The Hydriodide combined with one atom of Iodine, to form reddish-brown crystals $C_8H_{10}N_4O_2.HI.I$, rapidly decomposed by Water. (3) The compound generally known as **Tri-iodide,** but really **Di-iodo-Hydriodide,** $C_8H_{10}N_4O_2HI.I_2.H_2O$, described *C.D.* '90, i. 636. It forms prismatic crystals, steel-blue by reflected and red by transmitted light. On the addition of Water it is slowly decomposed with liberation of Iodine. Dose.—1 to 3 grs. in **pill,** with Glucose and Pulv. Acaciæ.

Higher compounds of Iodine than these are formed, but their composition is less definite, and the excess of Iodine can be removed with dry Chloroform. Nos. 2 and 3 do not colour Chloroform except in the presence of Water.

**CAFFEINÆ SODIO-SALICYLAS.**—An amorphous white powder, which is practically a mixture of Caffeine and Salicylate of Sodium containing rather more than half its weight of Caffeine.

**Solubility.**—1 in 1 of Water; 1 in 28 of Rectified Spirit.

(Dutch (Salicylas Natricus cum Coffeino), Hung. and Swiss; not in the others.)

**Medicinal Properties.**—The same as Caffeine, but being much more soluble is more easily administered; it is also suitable for **hypodermic injection.** Has been used in sea-sickness.—*B.M.J.* '87, ii. 768.

The solubility of Caffeine in Water is also increased by Benzoate of Sodium as well as by Antipyrin.

**CAFFEINÆ VALERIANAS.**—This compound was described in detail by us *C.D.* '90, i. 636. Theoretically it should contain 32 per cent. of Valerianic Acid. Commercially it varies from 1 per cent. (or less) to 13 per cent., this latter being very exceptional and only found in one or two German samples. The majority are little more than Caffeine scented with Valerianic Acid. The difficulty in forming a true salt is so great that it only exists as a chemical curiosity; but for all purposes of practical dispensing, a product obtained by drying up 1 of Anhydrous Valerianic Acid with 4 of *Anhydrous* Caffeine is superior to anything commercially obtainable.

## CAJUPUTI OLEUM.

### OIL OF CAJUPUT.

The Oil distilled from the leaves of *Melaleuca minor.*

Imported from Batavia and Singapore.

Very mobile, transparent, of a fine pale bluish-green colour.

The colour is generally supposed to be due to traces of Copper, this metal being almost invariably found in it.

On shaking 5 c. c. of the Oil with 5 c. c. of Water containing a drop of Diluted Hydrochloric Acid, the Oil loses its green tint and becomes nearly colourless.—*U.S.*

**Solubility.**—In all proportions of Rectified Spirit.

Sp. g. ·922—·924, with very little variation outside these limits.

(Belg., Dan., Dutch (also Depuratum), Fr., Ital., Norw., Port., Russ., Span. (Esencia de Cayeput), Swed., Swiss and U.S.; not in Austr. or Hung.)

**Medicinal Properties.**—A powerful topical and general stimulant, antispasmodic, and diaphoretic. Efficacious in dropsy, chronic rheumatism, hysteria, flatulent colic, and other spasmodic and nervous affections, and in low states of the system. Externally, diluted with Olive Oil (1 to 2), used to allay chronic rheumatism and gout pains. Applied with lint for toothache.

**Dose.**—1 to 4 minims on a lump of Sugar, or in any bland fluid.

Contained in Linimentum Crotonis.

### Preparation.

**SPIRITUS CAJUPUTI.**

Oil of Cajuput, 1; Rectified Spirit, 49; dissolve. =(1 in 50).

**Dose.**—30 to 60 minims.

(Not in the other Pharmacopœias.)

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## CALAMINA PRÆPARATA.

*B.P.Syn.*—Lapis Calaminaris Præparata.

Native Carbonate of Zinc, calcined in a covered earthenware crucible at a moderate temperature, powdered and freed from gritty particles by elutriation.

A pale pinkish-brown powder, without grittiness, almost entirely soluble in acids, with effervescence.

From the papers written on this subject since the issue of B.P. '85, it would appear to be practically impossible to obtain Calamina Præparata answering all the Official requirements. Genuine Calamine has a yellowish-grey colour; the reddish varieties are generally made on a basis of Sulphate of Barium.—*P.J.* xvi. 264, 692; xvii. 797; xx. 475; xxii. 744.

As calcination even at "a moderate temperature" is likely to expel much of the combined Carbonic Acid, a brisk effervescence can scarcely be expected.

(Port.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Mildly astringent, used in face lotions and dusting powders.

### Preparation.

**UNGUENTUM CALAMINÆ.**

Prepared Calamine, 1; Benzoated Lard, 5: mix. =(1 in 6).

This was Official in London, Edinburgh, and earlier Dublin Pharmacopœias; formerly called Turner's Cerate.

### Not Official.

**LOTIO ZINCI OXIDI.**—Oxide of Zinc, 60 grs.; Prepared Calamine, 60 grs.; Glycerine, 1 fl. drm; Water, 1 oz.—*B.S.H.*

A mild astringent in chronic eczema and acne rosacea.

Not Official.

## CALCIUM.

CALCIUM.

Ca, eq. 40.

Calcium, a brilliant white combustible metal, was discovered by Sir Humphrey Davy in 1808. Sp. g. 1·5. It is the metallic base of Lime.

**CALCII CARBONAS.** *See* CRETA PRÆPARATA.

## CALCII CARBONAS PRÆCIPITATA.

PRECIPITATED CARBONATE OF CALCIUM.

*B.P.Syn.*—PRECIPITATED CARBONATE OF LIME.

$CaCO_3$, eq. 100.

A white crystalline powder, insoluble in Water, dissolving in Hydrochloric Acid with effervescence.

The crystalline character of good commercial samples is not now noticeable even under a magnification of 12 diameters.

Chloride of Calcium, 5; Carbonate of Sodium, 13: dissolve each in 40 of boiling Distilled Water, mix; wash the precipitate with boiling Distilled Water thoroughly, and dry at 212° F. (100° C.).

**Test.**—With Diluted Nitric Acid it gives a clear solution, which, if perfectly neutral and deprived of Carbonic Acid by boiling, is neither precipitated by Saccharated Solution of Lime added in excess, nor by the solution of Nitrate of Silver—indicating the absence of Phosphates and Chlorides.

Even the best commercial samples may be expected to contain traces of Chlorine. It should not exceed ·5 per cent.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Swed., Swiss and U.S.; not in Norw. or Span.)

**Medicinal Properties.**—Antacid and astringent.

**Dose.**—10 to 60 grains, in powder or mixture.

Used in the preparation of Trochisci Bismuthi.

## CALCII CHLORIDUM.

CHLORIDE OF CALCIUM.

$CaCl_2, 2H_2O$.

More correctly $CaCl_2$, eq. 111.

It may be formed by neutralising Hydrochloric Acid with Carbonate of Calcium, adding a little solution of Chlorinated Lime and Slaked Lime to the solution, filtering, and evaporating till it becomes solid, and finally drying the salt at about 400° F. (204·4° C.).

When dried at 400° F. the salt is completely dehydrated, therefore the $2H_2O$ occurring in the B.P. formula is not correct.

In white agglutinated masses, dry, but very deliquescent.

**Solubility.**—1 in 1 of Water; 1 in 3 of Rectified Spirit.

**Tests.**—Evolves no Chlorine or Hypochlorous Acid on the addition of Hydrochloric Acid (absence of Hypochlorite). The aqueous solution is not precipitated by the addition of Lime Water.

Most samples are alkaline, probably owing to slight dissociation and loss of Hydrochloric Acid during the drying.

**Dose.**—3 to 10 grains.

(U.S.; Hung., Calcium Chloratum Fusum; Belg., Chloruretum Calcii; Port., Chloreto de Calcio; Fr., Chlorure de Calcium; Ital., Cloruro di Calcio; Span., Cloruro Calcico; not in the others.)

Used in the preparation of Æther, Æther Purus, and Chloroformum.

### Preparation.

**LIQUOR CALCII CHLORIDI.**

Chloride of Calcium, 1; Distilled Water, 5. Dissolve and filter if necessary. =(about 1 in 5⅓).

Sp. gr. 1·145.

This sp. g. is that given by a completely dehydrated Chloride, and as commercial Chloride of Calcium so frequently contains absorbed moisture the Liquor is better worked by the sp. g. or made from the fused salt.

(Not in the foreign Pharmacopœias.)

**Medicinal Properties.**—Given to arrest sickness; also given in glandular diseases.

**Dose.**—15 to 50 minims.

**Incompatibles.**—Lime Salts and Potassium Salts are mutually antagonistic, physiologically.—*B.M.J.* '87, ii. 1033.

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## CALCII HYDRAS.

### HYDRATE OF CALCIUM.

*B.P. Syn.*—SLAKED LIME.

$Ca(HO)_2$, eq. 74.

A white powder, strongly alkaline and caustic.

Lime recently burned, 32; Distilled Water, 20: slake the Lime, and sift the powder; place it in a well-stoppered bottle, and keep it excluded as much as possible from the air.

The Pharmacopœia directs that "it should be recently prepared," but this is unnecessary if air be excluded.

**Solubility.**—Sparingly soluble in Water (1 in 900); the solution, on exposure, soon acquires a film of Carbonate of Calcium.

**Test.**—Should not effervesce on the addition of an acid.

(Fr., Chaux Eteinte; not in the other Pharmacopœias.)

**Medicinal Properties.**—The Solution (Lime Water) is used in diarrhœa connected with acidity, and in some cases of dyspepsia; also to correct chronic vomiting, and vomiting of pregnancy. Given to children for rickets.

**Incompatibles.**—Vegetable and Mineral Acids, Alkaline and Metallic Salts, Tartar Emetic.

## Preparations.

### LINIMENTUM CALCIS.

Solution of Lime, 1; Olive Oil, 1: mix. =(1 in 2).

The best liniment to apply to burns and scalds. *See* also Carron Oil, p. 340.

(Belg., Solution of Lime and Almond Oil equal parts; Fr. (Linim. Calcaire), Solution of Lime and Almond Oil equal parts; Ital., Lime Water and Olive Oil equal parts; Port., Lime Water 9, Oil of Almonds, 1; Span., Lime Water 2, Oil of Almonds 1; Norw., Russ., Swed. and Swiss, Solution of Lime and Linseed Oil equal parts; U.S., Solution of Lime and Linseed Oil equal parts; all by weight except U.S.; not in the others.)

### LIQUOR CALCIS. SOLUTION OF LIME. *B.P.Syn.*—AQUA CALCIS, LIME WATER.

Slaked Lime, 1; Distilled Water, a sufficiency; wash the Slaked Lime with some of the Water till the washings acidified with Nitric Acid cease to give any turbidity with Nitrate of Silver; then add it to 80 of the Water contained in a stoppered bottle, and shake well for two or three minutes; after twelve hours subsidence, decant the clear solution into a well-stoppered green-glass bottle.

NOTE.—Washing the Lime is an improvement, to get rid of any Chloride of Calcium or alkalies that may be present.

When the Slaked Lime is good, one-fourth of the above quantity is sufficient.

**Test.**—10 ounces require for neutralisation at least 180 grain-measures of volumetric solution of Oxalic Acid, which corresponds to about 5 grains of Lime, CaO.

1 fluid oz precipitated with 1 grain of Oxalic Acid should not redden Litmus. —*Proctor.*

Lime Water, if saturated, should precipitate on boiling, owing to the Hydrate being less soluble in hot than in cold Water.

Bottles containing Lime Water should be kept full, and well closed from the air.

Each ounce contains about ½ grain of Lime.

**Dose.**—½ to 2 oz. as an antacid. *Brit. Ph. Dose.*—1 to 4 oz.

Usually given in milk.

(Austr., Belg., and Hung., Aqua Calcis; Dan., Dutch, Norw., and Swed., Solutio Hydratis Calcici; Fr., Eau de Chaux; Ger., Aqua Calcariæ; Port., Agua de Cal; Russ., Calcaria Caustica Soluta; Span., Solucion de Cal; Swiss, Calcium Hydricum Solutum; U.S., Liquor Calcis.)

Water becomes saturated with much less Lime than ordered in any of the Pharmacopœias, therefore Liquor Calcis is of the same strength in all.

Used in the preparation of Argenti Oxidum, Linimentum Calcis, and Lotiones Hydrargyri Flava and Nigra.

### LIQUOR CALCIS SACCHARATUS.

Slaked Lime, 1; Refined Sugar in powder, 2; Distilled Water, 20: digest for some hours, with occasional agitation, and finally separate the clear solution with a syphon, avoiding unnecessary exposure to air. It should be kept in well-closed vessels. =(about 1 in 62).

The B.P. directions are first to "mix the Lime and the Sugar by trituration in a mortar"; but there is no advantage in this, and as they are liable to cake if not rapidly diffused through the bulk of the Water, it is better to dissolve the Sugar first and then to add the Slaked Lime.

1 oz. = about 14 oz. Lime Water.

It has been shown that the colouration on keeping is due to the presence of Iron in the Lime employed, as when this is free from Iron no change takes place.—*P.J.* xix. 849.

The Lime used for this preparation should be free from Iron.

Like Lime Water, it precipitates on boiling, but clears again on cooling.

**Test.**—Sp. g. 1·052. 1 fluid ounce (460·2 grains by weight) requires for neutralisation 254 grain-measures of the volumetric solution of Oxalic Acid, which corresponds to 7·11 grains of Lime, **CaO**.

**Dose.**—15 to 60 minims in milk.

(Hung., Aqua Calcis Saccharata; not in the other Pharmacopœias.)

### Not Official.

**LINIMENT FOR FRECKLES.**—Liniment of Lime, 8; Solution of Ammonia, 1: mix.

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## CALCII HYPOPHOSPHIS.

### HYPOPHOSPHITE OF CALCIUM.

*B.P.Syn.*—Hypophosphite of Lime.

$Ca(PH_2O_2)_2$, eq. 170.

Obtained by heating Phosphorus and nearly twice its weight of Hydrate of Calcium with Water until Phosphuretted Hydrogen gas ceases to be evolved, then filtering the liquid, separating uncombined lime with Carbonic Acid gas, and evaporating the remaining solution until the salt separates in a crystalline condition.

This is sometimes improved by re-crystallisation.

A white crystalline Salt, with a pearly lustre, and a bitter nauseous taste. The crystals do not lose Water when heated to 300° F. (148·9° C.).

**Solubility.**—1 in 7 of Water, and scarcely more soluble in boiling Water. Insoluble in Spirit.

**Tests.**—The aqueous solution yields with Oxalate of Ammonium a white precipitate of Oxalate of Calcium insoluble in Acetic Acid but soluble in Hydrochloric Acid, and with Perchloride of Mercury a white precipitate of Mercurous Chloride changing to grey, owing to the reducing action of the Hypophosphite. The aqueous solution yields no precipitate with Acetate of Lead. 5 grains boiled for ten minutes with a solution of 12 grains of Permanganate of Potassium yields on filtration a nearly colourless solution. Heated to redness it ignites, evolving spontaneously inflammable Phosphuretted Hydrogen, and leaves a reddish-coloured residue amounting to about 80 per cent. of the salt.

As in the case of Sodium Hypophosphite the Official test with Acetate of Lead cannot be insisted upon. We do not believe a commercial sample can be found which does not give more or less precipitate or turbidity with Acetate of Lead, but to what impurity this is owing it is somewhat difficult to determine.

The *U.S.P.* states that the test is intended to show absence of "Phosphates"; Proctor assumes the test is intended to detect "Sulphites and Hyposulphites"; Cripps presupposes "Phosphites." The precipitating impurity does not seem to be alike in all cases, and neither suggestion accords with all the facts.

The loss on ignition varies so greatly with the conditions employed that it does not form a satisfactory test. When ignited in an open crucible the salt *gains weight* by oxidation, while in a covered crucible the loss may amount to 14 per cent., the residue, however, gaining weight when air is admitted. When strongly heated the residual powder is pure white on cooling it becomes a dull brown, changing on exposure to air to an orange-red colour. When fused into white globules the colour does not return on cooling.

(Belg., Hypophosphis Calcii; Dutch, Hypophosphis Calcicus; Fr., Hypophosphite de Chaux; Port., Hypophosphito de Cal; Span., Hipofosfito Calcico; Russ. and Swiss, Calcium Hypophosphorosum; U.S.; not in the others.)

**Medicinal Properties.**—Given in cases of nervous and general debility; it was supposed at one time to be useful in pulmonary consumption.

**B.P.Dose.**—5 to 10 grains; more commonly ordered in doses of 2 to 5 grains.

### Not Official.

**GLYCEROLA HYPOPHOSPHITUM.**—Hypophosphites of Calcium, Potassium, and Sodium, of each 1, dissolve these in Water 40; filter and add Sugar 40; Orange-flower Water 2; Cherry-laurel Water 2; dissolve and add Glycerine 12, and filter.

**Dose.**—1 to 2 drachms.

(U.S. Syrupus Hypophosphitum, containing these three Hypophosphites.)

**SYRUPUS CALCII HYPOPHOSPHITIS (SQUIRE).**—Hypophosphite of Lime, 4; Water, 38; Sugar, 59.

**Dose.**—A fluid drachm, containing 3 grains.

A Syrup of this strength was introduced in "Companion," 1877.

The following Syrup inserted in *B.P.C.* (taken from Extra Pharmacopœia '90), is only one-third the strength, necessitating an excessive quantity of Syrup for a full dose of the Salt.

**SYRUPUS CALCII HYPOPHOSPHITIS** (*B.P.C.*).—Hypophosphite of Calcium, 160 grains; Distilled Water, 9 oz.: dissolve and filter. To the filtered solution add Refined Sugar in coarse powder, 16 oz.: dissolve with the aid of heat, strain, and after cooling add Hypophosphorous Acid, 20 minims; Distilled Water, sufficient to produce 20. oz.: mix.

Each fluid drachm contains 1 grain of Hypophosphite of Calcium.

**Dose.**—1 to 4 fluid drachms.

## CALCII PHOSPHAS.

PHOSPHATE OF CALCIUM.

$Ca_3(PO_4)_2$, eq. 310.

A light white amorphous powder, prepared by dissolving Bone Ash in Hydrochloric Acid and precipitating with Ammonia, and drying the washed product at a temperature not exceeding 212° F. (100° C.)

Insoluble in Water.

**Tests.**—It dissolves without effervescence in Diluted Nitric Acid; the solution continues clear when a dilute solution of Acetate of Sodium is added in excess, but lets fall a white precipitate on the subsequent addition either of a little Oxalate of Ammonium or Perchloride of Iron.

The nitric solution is only rendered slightly turbid by solution of Nitrate of Silver. Of the recently dried powder, 10 grains dissolve perfectly, and without effervescence, in Diluted Hydrochloric Acid (indicating absence of Carbonate and Silica); and the solution yields with Ammonia a white precipitate, which is insoluble in boiling solution of Potash, and when washed and dried weighs nearly 10 grains.

Commercially the composition of this salt is very variable, and we have never seen a sample answering the B.P. test. Samples may contain 10 to 25 per cent. of Water, and the ratio of Lime to Phosphoric Acid approximates much more closely to the Phosphate $CaHPO_4$, than to the B.P. formula. We would infer that it is generally made by precipitating a solution of Chloride of Calcium with Phosphate of Sodium.

(Austr., Ger., Hung., Russ. and Swiss, Calcium Phosphoricum; Belg. and Dutch, Phosphas Calcicus; Dan., Phosphas Calcicus Præcipitatus; Fr., Phosphate de Chaux; Ital., Fosfato Bicalcic; Port., Phosphato de Cal; Span., Fosfato Calcico; U.S., Calcii Phosphas Præcipitatus; not in Norw. or Swed.)

**Medicinal Properties.**—For rickets and mollities ossium; said to be useful in scrofulous affections, and to promote union of bone fractures.

**B.P.Dose.**—10 to 20 grains; more commonly ordered in much smaller doses, 2 to 5 grains.

Contained in Pulvis Antimonialis—2 parts in 3.

## CALCII SULPHAS.

### SULPHATE OF CALCIUM.

*B.P.Syn.*—SULPHATE OF LIME. *N.O.Syn.*—CALCINED GYPSUM. PLASTER OF PARIS.

Native Sulphate of Calcium (**$CaSO_4$, $2H_2O$,** eq. 172) rendered nearly anhydrous by heat.

(Austr., Dan., Ger., Hung., Norw., Russ., Swed., Swiss and U.S.; not in the others.)

Introduced for the preparation of Calx Sulphurata.

Not Official.

## CALENDULA.

### COMMON MARIGOLD.

The florets of *Calendula officinalis.*

(Span., flowers; U.S., flowering herb; not in the others.)

### Preparation.

**TINCTURA CALENDULÆ FLORUM.**—Marigold flowers, dried, in No. 20. powder, 4; Proof Spirit, sufficient to percolate 20.

**Dose.**—5 to 20 minims.

(U.S., 1 in 5; not in the other Pharmacopœias.)

This has been added to the B.P.C. formulary.

## CALUMBÆ RADIX.

### CALUMBA ROOT.

The root of the perennial herb, *Jateorhiza calumba,* sliced transversely and dried.

From the forests of Eastern Africa between Ibo and the Zambesi. It is easily reduced to powder, which has a greenish tinge; it becomes browner with age, and deepens in colour when it is moistened.

**Tests.**—Moistened with a solution of Iodine, it becomes bluish-black—indicating presence of Starch. A decoction is not blackened by the persalts of Iron—indicating absence of astringent matter.

(In all the Pharmacopœias.)

**Medicinal Properties.**—A bitter stomachic and tonic, useful in debility of the digestive organs, and to allay nausea attendant on pregnancy. Given in convalescence from acute diseases, combined with Alkalies or Bismuth. It is one of the few bitters that can be prescribed with Salts of Iron.

**Dose.**—Of the powder 5 to 20 grains three or four times a day.

Frequently given with powdered Ginger and Rhubarb.

### Preparations.

**EXTRACTUM CALUMBÆ.**

Calumba Root, cut small, 1; Proof Spirit, 5: macerate in half the Proof Spirit for twelve hours, strain and press; macerate again with the remaining Spirit, strain and press; mix and filter the liquors, recover the Spirit by distillation, and evaporate the residue by the heat of a water-bath to a pill consistence.

16 parts of Root yield 1 to 1½ parts of Extract.

This preparation is now made with Proof Spirit; as pointed out in previous editions of the "Companion," the extract made with Spirit keeps well, but the aqueous extract becomes mouldy by keeping.

**B.P. Dose.**—2 to 10 grains, which is very much in excess of that given for the other preparations.

(Austr. and Hung., made with 70 p. c. Alcohol; Belg., Fr., Ital. and Span., made with 60 p. c. Alcohol; Dutch, made with 90 p. c. Alcohol; Port., made with 65 p. c. Alcohol; Swed., made with 50 p. c. Alcohol; U.S., **Fluid Extract** only, made with Dilute Alcohol; not in Dan., Ger., Norw. or Russ.)

**INFUSUM CALUMBÆ.**

Calumba Root, cut small, 1; cold Distilled Water, 20: macerate for half an hour and strain. =(1 in 20).

**Dose.**—1 to 2 oz.

(Span., 1 in 100; not in the other Pharmacopœias.)

Calumba Root contains starch and mucilage, both of which are dissolved by hot Water; cold Water dissolves the mucilage only.

Physicians prescribing for patients who wish to take with them a supply of their medicines containing Infusion of Calumba will find 1 drachm of Tincture to be of about the same strength as 1 oz. of the Infusion.

**TINCTURA CALUMBÆ.**

Calumba Root, cut small, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally; pack in a percolator, and let it drain, then pour on the remaining Spirit; when it ceases to drop, press, and add sufficient Proof Spirit to make 8. =(1 in 8).

**Dose.**—½ to 2 drachms for an adult; 5 minims for a child.

(Belg., Fr., Port., Span. and Swiss, 1 in 5; all by weight. U.S., 1 in 10; not in the others.)

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# CALX.

LIME.

An alkaline earth, Oxide of Calcium, $CaO$, eq. 56, with some impurities, obtained by calcining Chalk or Limestone so as to expel Carbonic Acid Gas. In compact masses of a whitish colour, which, when well sprinkled with rather less than their weight of Water, should crack, swell up, evolve much heat, and crumble to powder.

**Solubility.**—At 32° F. twenty oz. of Water dissolve 13·25 grs.
60° ditto 11·2
212° ditto 6·7

**Test.**—If previously slaked, it dissolves without effervescence in Diluted Hydrochloric Acid, and if this solution be evaporated to dryness, and the residue redissolved in Water, only a very scanty precipitate forms on the addition of Saccharated Solution of Lime—indicating absence of Phosphate of Calcium.

(In all the Pharmacopœias.)

### Preparation.

**CALCII HYDRAS.** *See* p. 147.

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# CALX CHLORINATA.

CHLORINATED LIME.

A product obtained by exposing Slaked Lime to the action of Chlorine Gas as long as the latter is absorbed; it may be regarded as consisting chiefly of a compound of Hypochlorite and Chloride of Calcium ($CaCl_2O_2,CaCl_2$), or as a direct compound of Chlorine and Lime ($CaOCl_2$.)

A dull white powder with a feeble odour of Chlorine.

As it becomes moist and gradually decomposes on exposure to the air, it should be preserved in well-closed vessels in a cool and dry place.

Partially soluble in Water and in Rectified Spirit. Decomposed by acids with formation of Hypochlorous Acid, which in the case of Hydrochloric Acid reacts with it to form Chlorine.

**Test.**—When fresh, 5 grains mixed with 15 grains of Iodide of Potassium, and dissolved in 4 fluid ounces of Water, produce, when acidulated with 1 fluid drachm of Hydrochloric Acid, a reddish solution which requires for the discharge of its colour at least 467 grain-measures of the volumetric solution of Hyposulphite of Sodium, corresponding to 33 per cent. of available Chlorine.

It should be noted that only a good and well-kept sample will yield this percentage of Chlorine.

In this test, the Hydrochloric Acid, acting on the Hypochlorite of Calcium, liberates Chlorine, and this reacting on the Iodide of Potassium, sets free an equivalent quantity of Iodine, which, if the Chlorinated Lime be good, will require the quantity stated of solution of Hyposulphite of Sodium to convert it into colourless Iodide of Sodium and Tetrathionate of Sodium.

(Dan., Norw., Swed. and U.S., Calx Chlorata; Austr. and Russ., Calcium, Hypochlorosum; Belg., Hypochloris Calcii; Fr., Chlorure de Chaux Sec; Ger., Hung. and Swiss, Calcaria Chlorata; Ital., Cloruro di Calce; Port., Cal Chlorada; Span., Hipoclorito Calcico Clorurado; Austr., Dan., Hung., Norw. and Swed., contain 20 p. c. of available Chlorine; Ger., Russ. and Swiss, 25 p. c.; Ital., 28·6 p. c.; Belg., 31·77 p. c.; Fr. and Span., 32 p.c.; U.S., 35 p. c.; Port., not indicated; not in Dutch.)

Used in the preparation of Chloroform and Liquor Sodæ Chlorinatæ.

## Preparations.

### LIQUOR CALCIS CHLORINATÆ.

Chlorinated Lime, 1; Distilled Water, 10; triturate, shake well for three hours in a bottle, and strain through calico. =(1 in 10).

**Test.**—Sp. g. 1·055. 80 grains by weight mixed with 20 grains of Iodide of Potassium dissolved in 4 ounces of water, when acidulated with 2 drachms of Hydrochloric Acid, give a red solution, which requires for discharge of its colour not less than 450 grain-measures of the volumetric solution of Hyposulphite of Sodium, corresponding to about 2 per cent. of available Chlorine. (Explanation of Test given under Calx Chlorinata.)

When made with the best Chlorinated Lime, and quite fresh, it may yield about 3 per cent. of available Chlorine.

(Brit., 1 in 10; Belg., 2·2 in 100; Fr., 1 in 45; Norw., 2 in 100; Russ. (Calcium Hypochlorosum Solutum), 2·5 p. c. of Chlorine; Span. and Swed., 1 in 40; not in the others.)

**Medicinal Properties.**—A powerful disinfecting and bleaching agent. Not much employed internally; externally as a **lotion** to foul ulcers, burns, chilblains, and cutaneous eruptions, especially the itch.

**Dose.**—20 to 40 minims in a wineglassful of Water.

**Antidotes.**—In case of poisoning by Chlorinated Lime the antidotes are, Emetics White of Egg, Milk, Flour; *not* Acids.

### VAPOR CHLORI.

Chlorinated Lime, 2 oz.; cold Water, sufficient to moisten it: the vapour to be inhaled from a suitable apparatus.

(Span., Fumigium Chlori; not in the other Pharmacopœias.)

## CALX SULPHURATA.

### SULPHURATED LIME.

*B.P.Syn.*—Calcii Sulphidum; Sulphide of Calcium.

A nearly white powder containing not less than 50 per cent. of Sulphide of Calcium, **CaS.**, eq. 72.

Sulphate of Calcium, 7; Wood Charcoal, 1; both in fine powder.

Mix thoroughly; heat to redness in an earthen crucible until the black colour has disappeared. Cool, and at once place the whitish residue in a stoppered bottle.

This process is taken from *P.J.* xv. 235, and it is evidently intended to be worked in an open crucible, although one would have expected it to work better in a closed one.

**Test.**—If 8 grains be added to a cold solution of 14 grains of Sulphate of Copper in an ounce of Water, a little Hydrochloric Acid added, and the mixture then well stirred and heated to a temperature approaching that of ebullition until all action has ceased, the filtered liquid should give no red colour with Ferrocyanide of Potassium (presence of at least 50 per cent. real Sulphide of Calcium).

The process described under Barium Sulphide, p. 121, is also applicable to Calcium Sulphide.

(Austr., Belg., Dutch and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Useful for boils and skin affections; has also been used as a depilatory.

**Dose.**—$\frac{1}{10}$ to 1 grain.

Best prescribed in **pill**, made up with Glucose. If the total weight of each pill be less than $\frac{1}{2}$ grain it is made up to this weight with Sugar of Milk. The pills are coated with Sandarach solution.

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## CAMBOGIA.

### GAMBOGE.

A Gum Resin, obtained from *Garcinia Hanburii.*

It forms a yellow emulsion when rubbed with Water; it is completely dissolved by the successive action of Rectified Spirit and Water.

It is imported from Siam, and consists of about 75 per cent. of Resin and 15 to 20 of Gum, the Resin being the active ingredient.

**Solubility.**—About three-fourths is soluble in Rectified Spirit, the solution is rendered an opaque yellow by Water; three-fourths also soluble in Ether; entirely soluble in Ammoniated Alcohol, which is not rendered turbid by the addition of Water.

**Test.**—An emulsion made with boiling Water, and cooled, does not become green on addition of Solution of Iodine—indicating absence of flour or starch.

It dissolves in Petroleum Spirit (sp. g. not under ·700) with an intense yellow colour destroyed by alkalies, and if to the solution a few drops of Alcoholic Solution of Ferric Chloride be added, the Alcohol is coloured intensely black.—*C.D.* '86, i. 508.

(Belg., Gummi Guttæ; Fr., Gomme-Gutte; Ger. and Swiss, Gutti; Ital., Gomma Gotta; Port., Gomma-Guta; Russ., Gummi Resina Gutti; Span., Gutagamba; Swed., Gummi-Resina Gutta; U.S., Cambogia; not in the others.)

**Medicinal Properties.**—A powerful purgative. It is employed in the treatment of dropsy, attended with torpidity of the bowels, generally in combination with Elaterium, Bitartrate of Potassium, or Jalap. As it is apt to occasion much sickness and griping, it is best given in small doses, repeated at short intervals, until it operates.

It may be given in **pill** or **emulsion**, or dissolved in an alkaline solution; the last method has been recommended in dropsical complaints.

*Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.*

**Dose.**—1 to 4 grains. In cases of tænia, it has been increased to 10 or 15 grains.

### Preparation.

### PILULA CAMBOGIÆ COMPOSITA.

Gamboge, 1; Barbadoes Aloes, 1; Compound Powder of Cinnamon, 1; Hard Soap, 2; Syrup, a sufficiency: mix the powders together, add the Syrup, and beat the whole into a uniform mass.

=(1 in 6 nearly).

**Dose.**—5 to 10 grains.

(Fr. and Belg. (Pilule Anderson) Aloes, Gamboge, Oil of Anise, and Honey; Port. (Pilulas de Aloes e Gomma Guta), the same with Soap; Fr. has also Pilules de Bontius, containing Ammoniacum and Vinegar instead of Cinnamon and Soap; U.S. (Pil. Catharticæ Comp.), contains Gamboge about 1 in 12; not in the others.)

## CAMPHORA.

### CAMPHOR.

A Stearoptene, $C_{10}H_{16}O$, obtained from the wood of *Cinnamomum camphora* (*Camphora Officinarum*) imported in a crude state and purified by sublimation. In solid colourless translucent crystalline masses, which present numerous fissures when of any size; somewhat tough, but readily powdered if moistened with Rectified Spirit, Ether, or Chloroform.

It is obtained in the crude state from the Island of Formosa and Japan, and is re-sublimed in this country and elsewhere. It occurs in commerce in bell-shaped masses, in tablets, and in powder (Camphoræ Flores).

Its sp. g. varies from ·986 to ·996. It evaporates entirely if left exposed to the air. 1 oz. of Powdered Camphor exposed to the air (70° F.) lost about 37 grains per twenty-four hours. It melts at 347° F. (175° C.), boils at 401° F. (205° C.), and in close vessels sublimes unchanged.

The Borneo Camphor from the *Dryobalanops aromatica*, though virtually the same as the Official, is valued very much more by the Chinese. Its formula contains $H_2$ more than ordinary Camphor, into which it may be converted by oxidising agents.

**Solubility.**—1 in 700 of Water; 1 in $1\frac{1}{4}$ of Rectified Spirit; or by weight, 1 in 1; 4 in 1 of Chloroform; 12 in 7 of Ether; 1 in 4 of Olive Oil (slowly); 1 in $1\frac{1}{2}$ of Oil of Turpentine; 2 in 1 of Glacial Acetic Acid; insoluble in Alkalies. 3 of Camphor rubbed with 1 of Carbolic Acid crystals become a clear solution. 3 of Camphor and 3 of Hydrate of Chloral rubbed together liquefy. Milk is a solvent and a good vehicle for its administration.

(In all the Pharmacopœias.)

**Medicinal Properties.**—Stimulant at first, afterwards sedative; antispasmodic, and diaphoretic. A feeble antiseptic.

In moderate doses, it produces (in health) mental exhilaration, increases the heat of the skin, and occasions diaphoresis. It allays nervous irritation. It is useful in cholera and diarrhœa, but in large doses it causes giddiness and disposition to sleep. It is an antaphrodisiac, and given in chordee. Camphor Spirit mixed with warm Water to bathe the nostrils is highly useful in hay fever, and relieves irritation of the nostrils in common cold; also used as an inhalation.

Externally, it is used as a counter-irritant to relieve pain.

**Dose.**—1 to 10 grains.

An excellent **pill** can be made by mixing Camphor, 36 grains; Curd Soap, 4 grains; Glycerine of Tragacanth, 10 grains; and dividing into 12 or more pills as required.

Symptoms of poisoning by Camphor: convulsions, lividity of countenance, stupor, arrest of urinary secretions.

**Antidotes.**—Stomach-pump or emetics, stimulants freely, and warmth to the extremities.

Used in the preparation of several Liniments and Unguentum Hydrargyri Compositum.

## Preparations.

**AQUA CAMPHORÆ.** *B.P.Syn.*—Mistura Camphoræ.

Camphor, crushed, ½ oz.; Distilled Water, 1 gallon = 160 oz.: macerate at least two days, confining the Camphor under the Water in a muslin bag attached to a glass rod.

**Dose.**—1 to 2 oz = rather more than ½ to 1 grain of Camphor.

The lower the temperature of the Water, the more Camphor will be dissolved.—*Y.B.P.* '71. 392.

(Dan., Mistura Camphorata, contains Camphor, Mucilage of Acacia, Syr. Cerasi, and Elderflower Water; Norw., similar to Dan.; Fr., Eau Camphrée; Port., same as Brit.; Span., Camphor, Elder, Honey, and Melissa Water; U.S., Camphor triturated with Alcohol, Precipitated Calcium Phosphate and Distilled Water; not in the others.)

**LINIMENTUM CAMPHORÆ.** *N.O.Syn.*—Oleum Camphoratum.

Camphor, 1; Olive Oil, 4: dissolve. =(about 1 in 5).

(Austr. (Oleum Camphoratum), 1 and 3; Dan., Norw. and Swed., 1 and 4; Belg., Fr., Ger., Ital. and Russ., 1 and 9; Span. (Aceite Alcanforado), 1 and 8; all with Olive Oil; Port., 1 and Almond Oil 9; Hung., 1 and Sesame Oil 2; Swiss, 1 and Olive Oil 9; U.S., 1 and Cotton-seed Oil 4; all by weight; not in Dutch.)

**LINIMENTUM CAMPHORÆ COMPOSITUM.**

Camphor, 5; Oil of Lavender, ¼; Strong Solution of Ammonia, 10; Rectified Spirit, 30: dissolve the Oil and Camphor in the Spirit, then add the Ammonia gradually, shaking them together until a clear solution is formed. =(about 1 in 8).

Stimulating. Most useful in tic-douloureux and chronic rheumatism. Painful neuralgia has been relieved by applying lint previously soaked in the liniment and covered with a dry napkin until redness is produced, and then lightly rubbing the part with the Solution of Bimeconate of Morphine (original).

**Linimentum Ammoniato-Camphoratum.**

Belg. Liquid Ammonia, 1; Camphorated Oil, 9.
Dan. Solution of Ammonia, 5; Camphor, 1; Rape Oil, 14.
Fr. Solution of Ammonia, 1; Camphorated Oil, 9.
Ger. Solution of Ammonia, 1; Camphorated Oil, 3; Poppy Oil, 1.
Norw. Solution of Ammonia, 2; Camphorated Oil, 1; Olive Oil, 2.
Port. Liquid Ammonia, 1; Camphorated Oil, 4.
Russ. Solution of Ammonia, 1; Camphorated Oil, 3; Sesame Oil, 1.
Swed. and Swiss, Solution of Ammonia, 1; Camphorated Oil, 3.
(All by weight; not in the other Pharmacopœias.)

**SPIRITUS CAMPHORÆ.** *N.O.Syn.*—Tinctura Camphoræ.

Camphor, 1; Rectified Spirit, 9: dissolve. =(1 in 10).

**Test.**—Sp. g. about ·850.

**Dose.**—10 to 30 minims in Milk or on Sugar.

(Austr., Belg., Dan., Dutch, Fr. (Teinture de Camphré Conc.), Ger., Ital., Norw., Port., Swed., Swiss and U.S., 1 in 10; Russ., 1 in 13; Hung., about 1 in 7; Span., 1 and 23; all by weight except U.S.)

**TINCTURA CAMPHORÆ COMPOSITA** *B.P.Syn.*—Paregoric. Paregoric Elixir. The Scotch Paregoric is Tinctura Opii Ammoniata.

Opium, in powder, 40 grs.; Benzoic Acid, 40 grs.; Camphor, 30 grs.; Oil of Anise, ½ drm.; Proof Spirit, 20 oz.: macerate seven days, filter, and add sufficient Proof Spirit to measure 20 oz.
=(1 grain of Opium in 240 minims).

As all the ingredients except the Opium dissolve readily, Opium 40 grs. might advantageously be replaced by the corresponding quantity of Tincture of Opium, 585 minims.

The Pimpinella Oil is preferable as being more soluble in Proof Spirit.

1 fluid drm. contains ¼ gr. Powder of Opium = ⅛ gr. of Extract of Opium.

Given with equal proportions of Tincture of Squill to allay spasmodic cough in bronchitis and in phthisis.

**Dose.**—15 to 60 minims, or for a child 2 to 5 mins.

Belg. **Elixirium Paregoricum.**—Opium, 5; Benzoic Acid, 5; Camphor, 3·5; Oil of Anise, 2·5; Alcohol (80 p. c.), 1000.

Dan. Norw. and Swed. **Tinctura Thebaiaca Benzoica.**—Opium, 5; Benzoic Acid, 5; Camphor, 3; Oil of Anise, 2; Diluted Alcohol, 1000.

Fr. **Elixir Paregorique.**—Extract of Opium, 3; Benzoic Acid, 3; Camphor, 2; Oil of Anise, 3; Alcohol (60 p. c.), 650.

Ger. and Russ. **Tinctura Opii Benzoica.**—Opium, 1; Benzoic Acid, 4; Camphor, 2; Oil of Anise, 1; Diluted Alcohol, 192.

Port. **Tinctura de Opio Composta,** and Swiss, **Tinctura Opii Benzoica.**—Opium, 1; Benzoic Acid, 1; Camphor, 1; Oil of Anise, 1; Alcohol (65 p.c.), 196.

U.S. **Tinctura Opii Camphorata.**—Opium, 4; Benzoic Acid, 4; Camphor, 4; Oil of Anise, 4; Glycerine, 40; Diluted Alcohol to 1000.
(All by weight except U.S.)

## Not Official.

**CAMPHOR BALLS.**—Camphor, 2; White Wax, 5; Spermaceti, 3; Oil of Almonds, 3; Tincture of Tolu, ¼: melt, and pour into half-ounce gallipots.

**CAMPHORA CUM CRETA.**—Camphor, 1; Prepared Chalk, 8: powder the Camphor by rubbing it with a few drops of Rectified Spirit, mix in the Chalk, and pass the whole through a sieve. A dentifrice.

**CAMPHORATED VINEGAR.**—Camphor, 1; Alcohol, 60; Vinegar, 180: mix.

**CERATUM CAMPHORÆ.**—Camphor, 2; White Wax, 3; Lard, 4; Oil of Almonds, 3: melt together and stir till cold.

**ESSENTIA CAMPHORÆ.**—Camphor, 1; Rectified Spirit, 20. In domestic use for making Julep. Given for diarrhœa, 5 minims every 10 or 15 minutes in water till diarrhœa is arrested.

**SPIRITUS CAMPHORÆ FORTIOR (Rubini's Essence).**—A saturated solution, in Rectified Spirit.

**CAMPHORIC ACID.**—Slightly soluble in Water, more readily in Rectified Spirit.

A 1 per cent. solution has been recommended in acute and chronic affections of the respiratory passages.—*P.J.* xix. 507.

One gramme given 3 or 4 times a day, or 2 grammes in the evening, checks the night sweating in phthisis.—*L.M.R.* '88, 276.

Not Official.

## CAMPHORA MONOBROMATA.

MONOBROMATED CAMPHOR.

$C_{10}H_{15}BrO$, eq. 231.

Colourless prismatic needles or scales, with a camphoraceous odour and taste.

**Solubility.**—Almost insoluble in Water; soluble 1 in 12 of Rectified Spirit; 10 in 7 of Chloroform; 1 in 2 of Ether; 1 in 8 of Olive Oil; sparingly in Glycerine.

**Tests.**—It melts at 169° F. (76° C.). When boiled with test-solution of Nitrate of Silver, it is decomposed and yields Bromide of Silver. It is soluble without decomposition in cold concentrated Sulphuric Acid, and will again separate unaltered if the solution be poured into Water.

(Dutch, Fr., Ital., Port., Span., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Hypnotic and sedative. Given in hysteria, epilepsy, chorea, spermatorrhœa, and delirium tremens; but its use requires caution.

**Dose.**—2 to 5 grains can be prescribed in **pills** with a mixture of Glucose and Treacle (equal parts), or can be dissolved in Almond or Olive Oil and emulsified with Mucilage and Water. It is also given with Extract of Belladonna.

Larger doses are sometimes given in delirium tremens.

It has been stated to be an antidote to Strychnine.

## CANELLÆ CORTEX.

CANELLA BARK.

The Bark of *Canella alba,* deprived of its corky layer and dried.

Imported from the West Indies.

(Fr., Port. and Swed.; not in the others.)

**Medicinal Properties.**—An aromatic, bitter tonic.

Contained in Vinum Rhei.

# CANNABIS INDICA.

INDIAN HEMP.

The flowering or fruiting tops of the female plants of *Cannabis sativa*, grown in India, and from which the resin has not been removed, dried. It is known in India as Gunjah or Ganga.

We are indebted to Dr. O'Shaughnessy for the first introduction of Indian Hemp into this country. He brought over a quantity from India, which the Author converted into extract for him, and distributed amongst a large number of the profession under Dr. O'Shaughnessy's directions.

(Austr., Belg., Dutch, Fr. (Chanvre), Hung., Norw., Dan., Port. (Canhamo), Russ., Span. (Canamo), Swed., Swiss and U.S. ; not in Ger. or Ital.)

**Medicinal Properties.**—Sedative, anodyne, and hypnotic. Has been used with success in migraine and delirium, also in menorrhagia and dysmenorrhœa. It is combined with Belladonna in whooping cough. In tetanus and hydrophobia.

It does not produce constipation or loss of appetite, on the contrary it restores the appetite which has been lost by chronic opium and chloral drinking.—*L.* '89, i. 625.

Not prescribed in powder.

**Antidotes.**—In case of over-dose, hot brandy-and-water may be given, vegetable acids, such as lemon juice, vinegar, and the like, and the patient be allowed to sleep. A blister to the nape of the neck is recommended to control its violent action.

## Preparations.

### EXTRACTUM CANNABIS INDICÆ.

Indian Hemp, in coarse powder, 1 ; Rectified Spirit, 5 : macerate seven days, press out the tincture, distil off the Spirit, and evaporate what remains by a water-bath to a soft extract.

By prolonged heating even on a water-bath, the extract becomes brown, insoluble in Spirit and soluble in Water.

6 of Indian Hemp yield about 1 of Alcoholic Extract.

**B.P. Dose.**—¼ to 1 grain in **pill.** As Extract of Indian Hemp varies considerably in strength, the dose should generally be small to commence with; toxic symptoms have been produced with 1 grain.

(Austr., Belg., Dutch, Fr., Hung., Norw., Port., Russ., Swed., Swiss and U.S. ; not in the others.)

In delirium tremens, 2 grains given every hour for four times gave relief.—*L.M.R.* '81, 192.

### TINCTURA CANNABIS INDICÆ.

Extract of Indian Hemp, 1 ; Rectified Spirit, 20 : dissolve.

=(1 in 20).

22 minims contain 1 grain of Extract.

**Dose.**—5 to 20 minims.

Best prescribed with 1 drm. of Mucilage to each ounce of Water; the Tincture should be triturated with the Mucilage previously diluted with twice its volume of Water, or the resin will be precipitated by the Water.

(Belg., Ger. and Port., 1 Extract in 20 ; the following are from Herb: Fr., Hung. and Swiss, 1 in 5 ; Russ., 1 in 10; all by weight; U.S., 15 in 100 ; not in the others.)

**Incompatibles.**—Waters and Watery Infusions.

### Not Official.

**CANNABINÆ TANNAS.**—An amorphous yellowish powder, sparingly soluble in Water, Alcohol, and Ether. Soluble in acidulated Alcohol.

**Dose.**—4 to 8 grains, mixed with Sugar and taken as a **powder.**

Was introduced as a hypnotic, but its effects are very uncertain.—*T.G.*'85, 329,379.

**CANNABINON.**—A soft resinous substance, generally found as a 10 p. c. trituration with Sugar of Milk, also introduced as a hypnotic, but the dose ($1\frac{1}{2}$ grains) was followed by excitement, collapse, and cramps.—*T.G.* '85, 286; *L.M.R.* '86, 434.

# CANTHARIS.

## CANTHARIDES.

The beetle, *Cantharis vesicatoria*, dried.

It is collected in Spain, France, Russia, Sicily, and Hungary.

Five samples exhausted with Chloroform, evaporated and treated with Carbon Bisulphide to remove Oil, yielded ·38, ·48, ·58, ·60, and ·62 per cent. of well crystalised Cantharidine.

The powder should be dry and kept closely corked, for if at all damp it is apt to acquire a putrid odour. A piece of Camphor kept in it prevents mites.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Externally its effects are rubefacient and irritant; by continued application it is vesicant. For the latter purpose the Emplastrum or Liquor Epispasticus is used, and is especially effective in inflammation of deep-seated parts, as in pleuritis, pericarditis, pneumonia, etc. It acts for a longer period, and is less irritating to the patient, than Ammoniacal or Acetic Acid embrocations. Internally as Tincture in chronic affections of the nervous system, paraplegia, etc. It has a diuretic effect, and is given in gleet or other mucous discharges; but it should be given cautiously, for it irritates the kidneys and sometimes produces strangury.

Has been recommended as a preventive of hydrophobia: the Ointment is applied to the wound, and one grain of Powdered Cantharides given internally daily for one or two weeks, treatment being suspended in case of strangury.—*B.M.J.* '86, ii. 873; *L.R.M.* '87, 20.

It is the basis of most of the applications used to increase the growth of hair.

In chronic inflammation of the bladder it should *not* be used as a counter-irritant, from its irritating effects on the urinary organs when absorbed by the skin. In such cases a solution of Nitrate of Silver ($\frac{1}{2}$ drm. to 1 oz. of water) is to be preferred.

**Antidotes.**—In case of poisoning by Cantharides use Emetics or stomach pump, followed by Castor Oil and Opium. Emollient Drinks.

### Preparations.

**ACETUM CANTHARIDIS.**

Cantharides, bruised, 2; Glacial Acetic Acid, 2; Acetic Acid, a sufficiency: add the Glacial Acetic Acid to 13 of Acetic acid, and in this mixture digest the Cantharides for two hours at a temperature of 200° F. (93·3° C.); when cold place them in a percolator, and when the liquid ceases to drop, pour over the residuum 5 of Acetic Acid, and when the percolation is finished, press, filter, and make the whole liquid up to 20 with Acetic Acid. =(1 in 10).

Sp. g. about 1·060.

(Port., about 1 in 6 : not in the other Pharmacopœias.)

### CHARTA EPISPASTICA. Blistering Paper.

Cantharides, in powder, 1 ; White Wax, 4 ; Spermaceti, $1\frac{1}{2}$ ; Olive Oil, 2 ; Resin, $\frac{3}{4}$ ; Canada Balsam, $\frac{1}{4}$ ; Distilled Water, 6 : digest all the ingredients, except the Canada Balsam, in a water-bath for two hours, stirring them constantly, then strain, and separate the plaster from the watery liquid ; mix the Canada Balsam with the plaster melted in a shallow vessel, and pass strips of Paper over the surface of the hot liquid, so that one surface of the Paper shall receive a thin coating of plaster. The Paper is usually ruled so as to indicate square inches.

(Charta Epispastica, Belg. Nos. 1 and 2, and Dutch ; Fr. and Span., Papier Epispastique Nos. 1, 2, and 3 ; not in the others.)

### COLLODIUM VESICANS. *N.O.Syn.*—Collodium Cantharidatum.

Blistering Liquid, 20 ; Pyroxylin, 1 : add the Pyroxylin to the Liquid in a stoppered bottle, and shake till dissolved.

*See* also Cantharidin, p. 163.

It is necessary that Pyroxylin B.P. should be used, or disappointment will result.

(Belg., Dan., Ger., Norw., Port., Russ., Swiss and U.S. ; not in the others.)

### EMPLASTRUM CALEFACIENS. *B.P.Syn.*—Warm Plaster.

Cantharides, in coarse powder, 1 ; Boiling Water, 5 ; Expressed Oil of Nutmeg, 1 ; Yellow Wax, 1 ; Resin, 1 ; Soap Plaster, 8 ; Resin Plaster, 13 : infuse the Cantharides in the Water for six hours, strain and press through calico, evaporate by a water-bath till reduced to one-third, then add the rest of the ingredients, melt and stir all together. =(about 1 in 25).

(U.S., Emplastrum Picis Cantharidatum, 1 in 40 ; not in the others.)

### EMPLASTRUM CANTHARIDIS.

Cantharides, in powder, 12 ; Yellow Wax, $7\frac{1}{2}$ ; Prepared Suet, $7\frac{1}{2}$ ; Resin, 3 ; Prepared Lard, 6 : melt the last four together, and stir in the first : continue the stirring until cold. =(1 in 3).

B.P. directs the Resin to be melted separately, but there is no advantage in this.

(Austr. and Fr., 1 in 3 ; Belg., Dutch, Hung., Ital., Norw., Span. and Swed., about 1 in 3 ; Dan., Ger., Port., Russ. and Swiss, about 1 in 4 ; not in U.S.)

Emplastrum Cantharidum Perpetuum, Austr., Norw. and Swed., 1 in $7\frac{1}{2}$ ; Swiss, 3 in 10 ; Dan., Emp. Canth. cum Euphorbio 1 in $6\frac{2}{3}$ ; Hung., 1 in $5\frac{1}{2}$ ; Belg., 1 in 8 ; Ger. and Russ., 1 in 10 ; not in the others.

Oiled tissue paper, or very thin silk, is sometimes placed between the plaster and the skin, to prevent irritant action on the urinary organs. In France, powdered Camphor is sprinkled on the blister for the same purpose.

### LIQUOR EPISPASTICUS. Blistering Liquid.

*B.P.Syn.*—Linimentum Cantharidis.

Cantharides, in powder, 5 ; Acetic Ether, a sufficiency : mix the

Cantharides with 3 of Acetic Ether; pack in a percolator, and after twenty-four hours add Acetic Ether to percolate 20. =(1 in 4).

It should be kept in a stoppered bottle. *See* also CANTHARIDIN.

For a stronger preparation *see below* Liquor Cantharidis Concentratus.

(Not in the other Pharmacopœias.)

### TINCTURA CANTHARIDIS.

Cantharides, in coarse powder, 1; Proof Spirit, 80: macerate, agitating occasionally, for seven days in a closed vessel, strain, press, filter, and add sufficient Proof Spirit to make 80. =(1 in 80).

**Dose.**—5 to 20 minims.

(Norw. and Swed., 1 and 30; U.S., 1 in 20; Austr., Dan., Ger., Dutch, Ital., Port., Russ. and Swiss, 1 in 10; Fr., 1 and 10, also with Acetic Ether 1 and 10; Span., 1 and 12½; Belg. and Hung., 1 and 5; all by weight, except U.S.)

### UNGUENTUM CANTHARIDIS.

Cantharides, 1; Olive Oil, 6; Yellow Wax, 1: digest the Cantharides in the Oil for twelve hours in a covered vessel: then place the vessel in boiling water for ¼ hour; strain through muslin with strong pressure, add the product to the Wax melted, and stir till cold. =(about 1 in 7).

Employed to promote discharge from a blistered surface.

(Belg., 1 in 11; Fr., Pommade Epispastique Verte, 1 in 33, and P. E. Jaune, 1 in 17; Port., about 1 in 23; Ital., Pomata di Cantaridi, 1 in 10; Swiss, 1 in 7; Ger. and Russ., about 1 in 5; Norw. and Swed., 1 in 5; Dan., Ung. Canth. Viride, about 1 in 3; Span., 3 in 10; U.S., Ceratum Cantharidis, 32 in 100; not in Austr., Dutch or Hung.)

## Not Official.

**CANTHARIDIN**, $C_{10}H_{12}O_4$.—Obtained from Cantharides. White crystalline scales. Melts at 200° C.

**Solubility.**—1 in 1150 of Rectified Spirit; 1 in 700 of Rectified Ether, sp. g. ·720; 1 in 55 of Chloroform; 1 in 150 of Acetic Ether, but even when dissolved at 60° F. part separates on standing; 1 in 200 of Almond Oil; 1 in 65 of Oil of Cloves.

Acetone is the best solvent for Cantharidin, which it dissolves 1 in 40, and as it is cheaper it possesses a double advantage over Acetic Ether. It makes a good Liquor Epispasticus, dissolves Pyroxylin, and is therefore also suitable for Collodium Vesicans.

(Belg., Dutch, Fr., Port. and Span.; not in the others.)

**LINIMENTUM CRINALE.**—Cantharidin, 1 gr.; Acetic Ether, 6 drms.: dissolve and add Rectified Spirit, 3 oz.; Castor Oil, 1 oz.; Oil of Lavender, 15 minims.

This Liniment is highly recommended for application to the head where the hair is falling off; but after applying it a few times the head should be washed, or it may accumulate and cause too much irritation. It may be diluted with equal parts (or more) of Rectified Spirit for delicate skins.

**LIQUOR CANTHARIDIS CONCENTRATUS.**—One fluid ounce = 1 ounce of Cantharides. It is obtained by repercolation with Acetic Ether, and is standardised to contain ·5 per cent. of Cantharidin. This Liquor forms a convenient substitute for Cantharides in making the various preparations; it effects a great saving of time and produces a better result.

Acetone is better as a solvent, but cannot at present be employed for Official preparations.

**UNGUENTUM STIMULANS.**—(Erasmus Wilson's.) Cantharides in Powder, 3; Lard, 12: macerate with a moderate heat for twenty-four hours and filter through paper.

In place of the Cantharides, 12 of Liquor Epispasticus or 3 of Liquor Cantharidis Concentratus may be employed, evaporated to a thin extract, and mixed with the melted Lard.

**BONI'S BLISTER.**—Camphor, 20; Chloral Hydrate, 30; melt and add Powdered Cantharides, 10; digest for an hour at 150° F.; filter.—*L.M.R.* '89, 19.

# CAPSICI FRUCTUS.

## CAPSICUM FRUIT.

The dried ripe fruit of *Capsicum fastigiatum.*

Imported from Zanzibar, and distinguished in commerce as Guinea Pepper and Pod Pepper. That from Nepaul has the finest flavour. These in powder are sold as Cayenne Pepper.

It yields its virtues to Water, Alcohol, Ether, Acetic Ether, and the fixed and volatile Oils.

The ash was determined from three samples of Fruits, also three samples of Pulvis Capsici: Fruits yielded, 3·75, 5·38, 4·52 per cent.; Pulvis Capsici, 4·44, 6·31, 4·49 per cent.

(Belg., Dan., Fr. (Poivre de Guinée), Ger., Port. (Pimentao), Russ., Span. (Pimiento), Swed., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—A powerful stimulant, used chiefly as a condiment. Given in intermittent fevers with Quinine, in low forms of fever, diarrhœa, cholera, and in the black vomit of hot climates; also in alcoholic dyspepsia. Used externally as a rubefacient in rheumatism and for chilblains.

**Dose.**—½ to 1 grain of the powder in a **pill**, or in dinner pills.

### Preparation.

**TINCTURA CAPSICI.**

Capsicum, bruised, ¾; Rectified Spirit, 20; macerate forty-eight hours with 15 of the Spirit, agitating occasionally; pack in a percolator, and let it drain, then pour on the remaining Spirit; as soon as it ceases to drop, press the marc, filter and add Rectified Spirit to make 20. =(1 in 27 nearly).

Small quantities are made with less trouble by maceration or by dilution of the Strong Tincture.

**Dose.**—10 to 20 minims.

Tinct. Capsici, 1½ drms. (increased); Tinct. Aurant., 4 drms.; Syr. Aurant., 4 drms.; Water to 6 ounces. Take a tablespoonful as required, three or four times a day, for dipsomania.—*B.M.J.* '75, ii. 415.

(Belg., 1 and 5; Dan., Ger., Russ. and Swiss, 1 in 10: all by weight. U.S., 1 in 20; not in the others.)

### Not Official.

**TINCTURA CAPSICI FORTIOR** (Dr. Turnbull's Tincture).—Capsicum in No, 40 powder, 0; percolated with sufficient Rectified Spirit to produce 30.

This has been added to B.P.C. formulary. Previously known as **Linimentum Capsici.**

Used externally for swollen chilblains as a counter-irritant, but *not* when the skin is *broken*. For **chilblains**, saturate a piece of sponge or flannel with the tincture, and rub the chilblain well until a strong tingling is produced; continue daily until recovery. A small dossil of lint or cotton, dipped into the tincture, is an excellent remedy for toothache.

Used by aurists to paint behind the ears as a counter-irritant, but a solution of Oil of Mustard is better.

**OLEO-RESINA CAPSICI** (*U.S.*)—*Syn.*—CAPSICIN.—Obtained by percolating Capsicum with Stronger Ether, distilling off the Ether, and straining out the fatty matter which separates. It is a thick liquid of a yellowish red colour, which becomes very fluid when gently heated, and at a high temperature volatilises. ½ a grain only, thus volatilised in a large room, will cause all who respire the air of the room to cough and sneeze. It is soluble in Alcohol, Ether, and Oil of Turpentine.

The active principle of Capsicum has been obtained by Thresh in well defined pearly white crystals, to which he has given the name **Capsaicin.**—*P.J.* vii. 21.

**EMPLASTRUM CAPSICI** (*U.S.*)—Spread an even layer of Resin Plaster on muslin, and allow it to cool; then apply a thin coating of Oleo-resin of Capsicum, by means of a brush, leaving a narrow blank margin along the edges.

Each square inch should contain 1 grain of Oleo-resin of Capsicum.

**UNGUENTUM OLEO-RESINÆ CAPSICI** (*B.P.C.*)—Oleo-resin of Capsicum, 2; Yellow Wax, 1; Benzoated Lard, 8. Melt the Wax and Lard at a low temperature, add the Oleo-Resin, mix, and strain if necessary. Stir till cold.

## CARBO ANIMALIS.

ANIMAL CHARCOAL. BONE BLACK.

The residue of bones which have been exposed to a red heat without the access of air; consists principally of Carbon, and Phosphate and Carbonate of Calcium.

When burnt with free access of air yields about 88 per cent. of White Bone Ash, Os Ustum.

(Belg., Dutch, Fr., Port. (Carvao Animal), and U.S.; not in the others.)

## CARBO ANIMALIS PURIFICATUS.

PURIFIED ANIMAL CHARCOAL.

Animal Charcoal from which its earthy salts have been almost wholly removed.

Bone Black, 16; Hydrochloric Acid, 10; Distilled Water, a sufficiency.

Digest the Bone Black in the Acid mixed with twice the quantity of Water at a moderate heat for two days, agitating occasionally, thoroughly wash on a calico filter, until what passes through gives scarcely any precipitate with Nitrate of Silver; dry, and heat to redness, in a covered crucible. Product about 10 per cent.

A black pulverulent substance; inodorous and almost tasteless.

**Tests.**—Ten or twelve grains well shaken with an ounce of Water containing about a fluid drachm of "Solution of Litmus" removes the dissolved colouring matter; the mixture, when thrown upon a filter, passing through colourless. When burned at a high temperature, with a little Red Oxide of Mercury and free access of air, it leaves not more than about 2 per cent. of residue.

As stated in last edition, commercial samples contain much more ash than the above.

If it contain Carbonate of Calcium, Hydrochloric Acid will cause effervescence; and if Phosphate of Calcium be present, the acid will dissolve the salt, and yield it as a precipitate on the addition of Ammonia.

The Official process (given above) will not yield a product answering the Official tests, a very small proportion only of the earthy matter being removed. The best and most practicable process is found to be :—" Boil the Charcoal for some hours with twice its weight of Hydrochloric Acid and twice its weight of Water; filter from the acid solution, and boil up again with half these quantities of Acid and Water. Wash free from acid and soluble salts, and stove-dry the product." Crucible ignition is not required. This yields a char containing Water 8, Ash 14, Carbon 78 per 100, with a strong decolorising action. Caramel solution is preferable to Litmus as a standard colour.—*P.J.* xxiii. 192.

(Belg., Fr., Ital. (Carbone di Ossa Depurato), U.S.; not in the others.)

**Medicinal Properties.**—It is much used as a decolorising agent in various pharmaceutical processes, and will extract alkaloids from aqueous solution, hence it is administered as an antidote in some cases of poisoning. It has been stated that Morphine and Strychnine may be swallowed with impunity if mixed in due proportion with Purified Animal Charcoal, and we find that an acid solution of Strychnine containing ·01 gramme of alkaloid ceases to give a precipitate with Mayer's reagent after occasional agitation during one hour with 1 gramme of Powdered Animal Charcoal.

**Dose.**—20 to 60 grains.

## CARBO LIGNI.

### WOOD CHARCOAL.

Wood charred by exposure to a red heat without access of air.

Oak, Beech, Hazel, Willow, and Poplar are employed.

**Test.**—When burned at a high temperature, with free access of air, it leaves not more than 2 per cent. of ash.

6 Samples examined showed 2 to 7 per cent. of ash.—*P.J.* xx. 946.

(In all the Pharmacopœias except Dan.; Fr., Charbon Végétal.)

**Medicinal Properties.**—Antiseptic and absorbent. Given in powder or in capsules in cases of distension by intestinal gas, and in foul eructations; also in dyspepsia attended with flatus and acidity. Externally, as a poultice, it absorbs the fœtor of ulcers.

It has been given in **powder** diffused in Water, also in the form of **Capsules**, **Cachets**, and **Biscuits.** The most palatable way is to mix it with **Chocolate.**

**Respirators** of Charcoal are made to protect the lungs from poisonous gases.

**Dose.**—20 to 60 grains.

Preparation.

### CATAPLASMA CARBONIS.

Wood Charcoal, in powder, 1; Crumb of Bread, 4; Linseed Meal, 3; boiling Water, 20: soak the Bread in the Water near the fire for ten minutes, add the Linseed Meal and half the Charcoal, stirring to a soft poultice, sprinkling the remainder of the Charcoal on the surface.

(Port.; not in the other Pharmacopœias.)

Not Official.

## CARBON BISULPHIDE.

$CS_2$, eq. 76.

A colourless, highly-refractive liquid, with a characteristic odour. It is very inflammable. In the crude state it contains dissolved Sulphur and other impurities, and should always be re-distilled for pharmaceutical purposes.

**Solubility.**—About 1 in 500 of Water, readily soluble in Alcohol, Ether, Chloroform, the fixed and volatile Oils.

It is a good solvent for Iodine, Phosphorus, Precipitated Sulphur, etc.

Sp. g. 1·272. It should not affect the colour of blue Litmus paper moistened with Water (absence of Sulphurous Acid). When evaporated spontaneously, it should leave no residue (Sulphur). It should not blacken Solution of Acetate of Lead (absence of Hydrosulphuric Acid).

(Belg., Fr., Port., Span. and U.S.; not in the others.)

**Medicinal Properties.**—Antiseptic. Dr. Turnbull used it as an application to enlarged lymphatic glands; also the **vapour** to the ear in deafness, applied on a sponge or absorbent wool in a wide-mouthed bottle.

**Dose.**—Two ounces of a saturated Solution in Water, mixed with Milk or Syrup, have been given in typhoid fever.—*L.* '89, i. 596.

One or two ounces daily of a saturated Solution in Peppermint Water have been given as a substitute for Bergeon's treatment of phthisis.—*B.M.J.* '88, i. 421.

## CARDAMOMI SEMINA.

CARDAMOMS.

The dried ripe seeds of the Malabar Cardamom, *Elettaria cardamomum*, best kept in their pericarps, in which condition they are imported; but when required for use they should be separated and the pericarps rejected.

1 of fruit yields about $\frac{3}{4}$ of seeds.

The ash was determined of Pericarps, Seeds, and Pulvis Cardamomi: Pericarps (three samples) yielded 10·4, 12·0, 13·4 p. c.; Seeds (three samples), 2·38, 2·81, 3·85 p. c.; Pulvis (three samples), 7·56, 6·33, 9·93 p. c.; these results seem to indicate that the Pulvis Cardamomi was not obtained from the seeds only, as directed in the Pharmacopœia. Even whole fruits had but an average of 5·5 p. c.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Ital.)

**Medicinal Properties.**—Stomachic and carminative; less heating and stimulating than some others. A useful adjuvant to purgatives to prevent griping.

**Dose.**—Of the seeds powdered, 5 to 20 grains.

Contained in Extractum Colocynthidis Compositum, Pulvis Cinnamomi Compositus, Pulvis Cretæ Aromaticus, Tinctura Gentianæ Composita, Tinctura Rhei, and Vinum Aloes.

### Preparation.

### TINCTURA CARDAMOMI COMPOSITA.

Cardamom seeds, freed from their pericarps, bruised, 1 oz.; Caraway fruit, bruised, 1 oz.; Raisins, freed from seeds, 8 oz.; Cinnamon Bark, bruised, 2 oz.; Cochineal, in powder, 220 grains; Proof Spirit, 80 oz.: macerate forty-eight hours with $\frac{3}{4}$ of the Spirit, agitating occasionally, pack in a percolator, and let it drain, pour upon it the remainder of the Spirit, and when it ceases to drop, press the marc, filter, and add sufficient Proof Spirit to make 80 oz. =(1 in 80).

Note.—If the above B. P. instructions are followed the product will be more than 80 oz., without making up.

**Dose.**—$\frac{1}{2}$ to 2 drms.

(U.S., 1 in 50, contains Glycerine, and is made with the *fruit* of the Cardamoms; not in the other Pharmacopœias.)

Contained in Decoctum Aloes Compositum, Mistura Ferri Aromatica, Mistura Sennæ Composita, Tinctura Chloroformi Composita.

### Not Official.

**OLEUM CARDAMOMI.**—A pale aromatic Oil distilled from Cardamom Seeds, which contain about 4 p.c. Sp. g. ·900—·940.

**TINCTURA CARDAMOMI.**—Cardamom Seeds, bruised, 1; sufficient Proof Spirit to percolate 10.

**Dose.**—30 to 60 minims.

(Port. and Swiss, 1 in 5 by weight; U.S., 1 in 10; not in the others.)

**TINCTURA CARMINATIVA** (*B.P.C.*).—Cardamom Seeds, bruised, 600 grains; Stronger Tincture of Ginger, $1\frac{1}{4}$ fluid ounces; Oil of Cinnamon, 100 mins.; Oil of Caraway, 100 mins.; Oil of Cloves, 100 mins.; Rectified Spirit sufficient to produce 20 oz.: macerate the Cardamoms in 15 oz. of the Spirit for a week, decant, express, and dissolve the Oils in the mixed tinctures and add Rectified Spirit to make 20 oz.

**Dose.**—2 to 10 minims. Introduced as a flavouring agent.

By replacing the 600 grains of Cardamom Seeds by 24 minims of Oil of Cardamoms the maceration is avoided.

## CARUI FRUCTUS.

### CARAWAY FRUIT.

The dried fruit of *Carum carui.*

Cultivated in England and Germany. The biennial herb flowers in the second year, and the fruit ripens in July or August. Yields from 3 to 6 per cent. of Oil.

The ash was determined from three samples of Seeds and three samples of Pulvis Carui: Seeds, 6·68, 5·72, 7·16 p. c.; Pulvis, 5·87, 6·51, 7·05 p. c.

(Austr., Belg., Fr., Ger. (Kümmel), Norw., Port. (Alcaravie), Russ., Span. (Alcarabea), Swed., Swiss. and U.S.; not in Dan., Dutch, Hung. or Ital.)

**Medicinal Properties.**—Aromatic, stomachic, and carminative. Used occasionally in flatulent colic, and as an adjuvant to other medicines.

Used in the preparation of Conf. Opii, Conf. Piperis, Pulv. Opii Comp., Tinct. Cardamomi Comp., and Tinctura Sennæ.

### Preparations.

**AQUA CARUI.**

Caraway Fruit, bruised, 1; Water, 20: distil 10. =(1 in 10).

**Dose.**—1 to 2 oz.

(Swed., same as Brit.; not in the other Pharmacopœias.)

**OLEUM CARUI.**

The Oil distilled in Britain.

Caraway Oil consists principally of a Hydrocarbon **Carvene** ($C_{15}H_{24}$) and an oxidised body **Carvol** ($C_{10}H_{14}O$). These occur in different proportions in the Oil according to its source and method of distillation. It is the Carvol to which the Oil owes its medicinal properties. The higher the sp. g. and the greater the solubility in 50 per cent. Alcohol, the more Carvol is likely to be contained in the sample. The sp. g. of the Oil varies between very wide limits. We have bought samples as low as ·889, but the usual range is between ·910 and ·925.

*C.D.* '83, 598, gives for English Caraway Oil sp. g. ·952—·966.

**Carvol** is also found in the Oils of Dill, Cumin, and German Mint (Mentha Crispa).

Added to purgative medicines to prevent griping.

**Dose.**—1 to 4 minims.

(Austr., Ger., Port., Swiss, and U.S.; Fr., Huile Volatile de Carvi; Dan., Norw. and Swed., Aetheroleum Carvi; Russ., sp. g. ·900—·960.)

Used in the preparation of Confectio Scammonii and Pilula Aloes Barbadensis.

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## CARYOPHYLLUM.

### CLOVE.

The dried flower-bud of *Eugenia caryophyllata.*

Cultivated in Penang, Bencoolen, Amboyna, Mauritius, and Zanzibar.

The ash was determined from three samples of Cloves and three samples of Pulvis Caryophylli: Cloves yielded, 4·78, 4·82, 5·11 p. c.; Pulvis, 6·13, 6·97, 6·97 p. c.

**Test.**—They emit, when indented with the nail, an Oil with a strong fragrant odour.

(Austr., Belg., Dan., Fr. (Girofles), Ger., Hung., Ital. (Garofani), Norw., Port. (Cravinho), Russ., Span. (Clavo), Swed., Swiss and U.S.; not in Dutch.)

**Medicinal Properties.**—Stimulant, aromatic, and carminative; sometimes administered in substance or infusion to correct nausea, vomiting, and flatulency, and to promote digestion. But chiefly used to qualify other medicines.

The powder used in Infus. Aurantii. Co., Mist. Ferri Aromatica, and Vin. Opii.

**Dose.**—5 to 10 grains.

### Preparations.

**INFUSUM CARYOPHYLLI.**

Cloves, bruised, 1; boiling Distilled Water, 40: infuse half an hour, and strain. =(1 in 40)

**Dose.**—1 to 4 oz.

(Not in the other Pharmacopœias.)

**Incompatibles.**—Lime Water, Salts of Iron, Mineral Acids, Gelatine.

### OLEUM CARYOPHYLLI.

The Oil distilled in Britain. Colourless or pale yellow when recently distilled, but becomes reddish-brown by keeping.

Sp. g. (several examples examined) 1·041 to 1·063; the majority were over 1·055. Schimmel states the sp. g. of a genuine Oil never falls below 1·060; but commercial Oil in this country rarely exceeds that figure.

The principal constituent of Clove Oil is **Eugenol**, a phenol having the formula $C_{10}H_{12}O_2$; details for its estimation will be found in *P.J.* xxii. 451.

The percentage of Eugenol varies between 77 and 90 per cent., and it is found that a "stem" Oil yields as high an average as that from the flower-buds.

**Solubility.**—1 in 60 of Proof Spirit; in all proportions of Rectified Spirit, Ether, and Strong Acetic Acid.

Used as an adjunct to purgatives; or applied to carious teeth.

**Dose.**—1 to 4 minims.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

Contained in Confect. Scammonii, Pil. Colocynth. Co., Pil. Coloc. et Hyoscyami.

**CASCARA SAGRADA.** *See* RHAMNI PURSHIANI CORTEX.

## CASCARILLÆ CORTEX.

CASCARILLA BARK.

The bark of *Croton Eluteria*, from the Bahamas.

It has an agreeable aromatic odour, more especially when burned.

It may contain from ½ to 2 per cent. of an aromatic Oil.

(Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Swed., Swiss and U.S.; not in Hung. or Span.)

**Medicinal Properties.**—Aromatic and stomachic. With some physicians it is a favourite tonic. Used in dyspepsia, chronic diarrhœa, dysentery, and in recovery from acute diseases. Formerly used in intermittent fevers, but now almost entirely superseded by Cinchona for that purpose.

**Dose.**—In powder 10 to 30 grains.

### Preparations.

### INFUSUM CASCARILLÆ.

Cascarilla Bark, in No. 20 powder, 1; boiling Distilled Water, 10: infuse half an hour, and strain. =(1 in 10)

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias.)

**Incompatibles.**—Lime Water and Metallic Salts.

This infusion quickly changes, and will scarcely keep good for a day in summer, but when it is prescribed with an aromatic Tincture keeps good.

2 oz. of Infusion is of about the same strength as ½ oz. of Tincture.

### TINCTURA CASCARILLÆ.

Cascarilla Bark in No. 40 powder, 1; Proof Spirit, 8; macerate forty-eight hours with 6 of the Spirit, agitating occasionally; pack in a percolator, let it drain, and pour on the remainder of the Spirit, and when it ceases to drop, press the marc, filter, and add Proof Spirit to make 8. =(1 in 8).

**Dose.**—½ to 2 drms.

(Austr., 1 in 10; Belg., Dan., Fr., Norw., Russ., Swed. and Swiss, 1 in 5; not in the others.)

This Tincture is frequently prescribed with the diluted mineral acids, and then the resin is separated, which fills the mixture with minute floccules; it is therefore better, when giving acids, to prescribe the Infusion.

## CASSIÆ PULPA.

CASSIA PULP.

The pulp obtained from the recently imported pods of the Purging Cassia, *Cassia fistula.*

Imported from the East or West Indies.

Viscid, blackish-brown, with a sweet taste. When obtained separately, the pulp frequently contains the seeds and the partitions or dissepiments; these should be removed when it is used for pharmaceutical purposes.

(Austr., Fruit and Pulp; Belg., Fruit and Extract; Fr., Pulpe de Casse, also Extrait de Casse; Ital., Port., Span., Swiss and U.S., Fruit; not in the others.)

**Medicinal Properties.**—Laxative. Useful in small doses for habitual costiveness. Large doses occasion nausea, flatulence, and griping; generally given in combination.

**Dose.**—As a laxative, 60 to 120 grs.; as a purgative, 1 to 2 oz.

Contained in Confectio Sennæ; 1 part in 8 nearly.

Not Official.

## CASTOREUM.

The dried preputial follicles and their secretion, obtained from the Beaver, *Castor fiber*, the oil sacs being rejected.

Russian Castor contains 4·5 p.c. and Canadian 2 p.c. of Castorin. The tincture forms with water a milky liquid which on the addition of Ammonia becomes clear when made with Russian Castor, but remains cloudy when made with Canadian. —*Hager.*

(In all the Pharmacopœias except Ger. and U.S.)

**Medicinal Properties.**—Moderately stimulant and antispasmodic; occasionally used in hysteria.

**Dose.**—Of the powder 5 to 10 grains.

### Preparation.

**TINCTURA CASTOREI.**—Castor, in coarse powder, 1; Rectified Spirit, 20: macerate seven days, agitating occasionally, strain, press, and add sufficient Rectified Spirit to make 20. = (1 in 20).

**Dose.**—½ to 1 drm.

(Austr., Dan., Hung., Norw., Port. and Swed., 1 in 5; Dutch, 1 in 8; Belg., Fr., Russ. and Swiss, 1 in 10; Span., 1 in 25; all by weight. Not in Ger., Ital. or U.S.)

## CATAPLASMATA.

The CATAPLASMS were contained in the London Pharmacopœia, and have been adopted by the Brit. Ph. with very slight modification. The formulas will be found under the names of the substances from which they are prepared.

CATAPLASMA CARBONIS, 1 in 28.
CATAPLASMA CONII, about 1 juice in 14.
CATAPLASMA FERMENTI. *See* CEREVISIÆ, about 1 in 4.
CATAPLASMA LINI, 1 meal in 3½.
CATAPLASMA SINAPIS, about 1 powder in 5.
CATAPLASMA SODÆ CHLORINATÆ, 1 solution in 7.

Cataplasms that are not Official are enumerated in the Index.

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## CATECHU.

### CATECHU.

*B.P.Syn.*—CATECHU PALLIDUM.

An extract of the leaves and young shoots of *Uncaria Gambier*.

Prepared in Singapore and in other places in the Eastern Archipelago.

It generally occurs in cubical reddish-brown pieces, also in square sticks, porous, bitter and astringent in taste.

Terra Japonica is a trade term (now almost obsolete) applied both to Cutch and Gambier.

**Solubility.**—Almost entirely soluble in boiling Water. 75 per cent. is soluble in Rectified Spirit. Of 100 parts, only 50 to 60 are dissolved by cold Water, and the solution is bright.

**Tests.**—The decoction when cold is not rendered blue by Iodine.

30 parts of Isinglass precipitate the whole of the astringent matter.

The pale Catechu being already in the Edin., the Brit. 1864 retained it with the Black; but the black is the one adopted by other Pharmacopœias, and is preferred in the arts and manufactures; it is well known to be far superior to the pale in astringency, and always to be had of good quality; it is therefore a matter of surprise and regret that it has been rejected from the British Pharmacopœia.

(Ger.; Port., Cato; not in the others. *See* CATECHU NIGRUM, p. 173.)

**Medicinal Properties.**—A powerful astringent. Used chiefly in diarrhœa and some forms of atonic dyspepsia accompanied with pyrosis; also as a remote astringent for hæmorrhage and mucous discharges. Lozenges are the best medium for administering it in relaxed conditions of the uvula.

**Dose.**—10 to 30 grains in powder.

**Incompatibles.**—The Alkalies, Metallic Salts, and Gelatine.

### Preparations.

**INFUSUM CATECHU.**

Catechu, in coarse powder, 160 grs.; Cinnamon Bark, bruised, 30 grs.; boiling Distilled Water, 10 oz.: infuse half an hour, and strain.

**Dose.**—1 to 2 oz. =(about 1 in 27).

(Not in the other Pharmacopœias.)

### PULVIS CATECHU COMPOSITUS.

Catechu, 4; Kino, 2; Rhatany Root, 2; Cinnamon Bark, 1; Nutmeg, 1: all in powder; mix. =(1 in $2\frac{1}{2}$).

Keep it in a stoppered bottle.

**Dose.**—20 to 40 grains. Aromatic, astringent.

(Not in the other Pharmacopœias.)

### TINCTURA CATECHU.

Catechu, in coarse powder, $2\frac{1}{2}$; Cinnamon Bark, bruised, 1; Proof Spirit, 20: macerate for seven days with agitation, strain, press, filter, and add Proof Spirit to make 20. =(1 in 8).

**Dose.**—$\frac{1}{2}$ to 2 drms., or for a child 5 to 10 mins.

(U.S. (Tinct. Catechu Co.), 1 in 10; Austr., Belg, Fr. (Tinct. Cachou), Dutch, Ger., Port., Russ., and Swiss, 1 in 5; all by weight (except U.S.), and with **Black Catechu.** Not in the others.)

### TROCHISCI CATECHU.

Lozenges made with Catechu, Sugar, and Gum Acacia.

Each lozenge contains 1 grain of Catechu.

**Dose.**—1 to 6 lozenges.

(U.S., 1 gr. Black Catechu in each; Belg. (Tabella) 3 grs. in each; Dutch, about $1\frac{1}{2}$ grs. in each; Ital., Pastiglie di Catechu; not in the others.)

### Not Official.

**CATECHU NIGRUM.**—Black Catechu, Pegu Catechu, Cutch.—An extract from the heart wood of *Acacia Catechu*, dried and imported from Pegu. It generally occurs in irregularly shaped blackish-brown masses, astringent, and bitter in taste.

**Solubility.**—Of 100 parts, only 88 are dissolved by cold Water, the solution being very turbid. 60 parts of Isinglass precipitate the whole of the astringent matter.

**Dose.**—5 to 15 grains.

(Austr., Belg., Dutch, Fr. (Cachou), Ger., Ital., Port. (Cato), Russ., Span., Swiss and U.S.; not in the others.)

⁂ As **GUMMI RUBRUM** is advantageously used as a substitute for Catechu, it may be proper to mention it here, but it will be found in its alphabetical order with its preparations.

## CERA ALBA.

WHITE WAX.

Yellow Wax, bleached by exposure to moisture, air, and light.

Hard, nearly white, translucent.

**Test.**—Should respond to the tests given under Cera Flava.

Melting points of three samples, determined by the process given under Cera Flava, 140°, 140°, 142° F.

**Solubility.**—Entirely in Oil of Turpentine, insoluble in Rectified Spirit; slightly, and not uniformly, soluble in (cold) Ether; about 1 in 100 of boiling Rectified Spirit; 1 in 10 of boiling Ether.

This wax has been much used in ointments, but the Author has observed that the ointments made with it grow rancid, and when the yellow wax is used the ointment keeps a long time without rancidity.

(Austr., Belg., Dan., Fr., Ger., Hung., Ital., Norw., Port. (Cera branca), Russ., Span., Swed., Swiss and U.S.; not in Dutch.)

**Medicinal Properties.**—Emollient; chiefly employed as an ingredient in Ointments.

Contained in Unguent. Cetacei, and Simplex; also in Charta Epispastica.

### Preparation.

**UNGUENTUM SIMPLEX.**

White Wax, 2; Benzoated Lard, 3; Almond Oil, 3: melt the Wax and Lard in the Oil in a water-bath; then remove the mixture and stir constantly while it cools. =(1 in 4).

The Ointment is apt to granulate if the stirring is not continued until it solidifies.

(Austr. and Hung., Lard 8, White Wax 2; Belg., Lard 17, White Wax 3; Dutch, Yellow Wax 3, Olive Oil 7; Swiss, White Wax 30, Olive Oil 70, Benzoin 2; U.S., Lard 8, Yellow Wax 2; Fr. (Cérat Simple), Oil of Almonds 6, White Wax 2; Ger. (Unguentum Cereum), Olive Oil 7, Yellow Wax 3; Port. (Ceroto Simples), White Wax 3, Almond Oil 7; Span. (Cerato Simple), White Wax 1, Almond Oil 3; Swed. (Ceratum Album), White Wax 1, Spermaceti 1, Benzoated Lard 3, also (Ceratum Flavum) Yellow Wax 1, Olive Oil, 2; Dan. and Norw. (Ung. Cerae), and Russ. (Ung. Cereum), Olive Oil 3, Yellow Wax 1.)

Used in the preparation of the following Unguenta:—Antimonii Tartarati, Creasoti, Elemi, Hamamelidis, Hydrargyri Ammoniati, Hydrargyri Iodidi Rubri, Plumbi Carbonatis, Plumbi Iodidi, Resinæ.

### Not Official.

**COLD CREAM.**—White Wax, 1; Spermaceti, 1; Oil of Almonds, 8; Rose Water, 11; Otto of Rose to perfume it. Melt together, by means of a water-bath, the Oil, Spermaceti, and Wax, add the Otto, strain through muslin into the Rose Water; stir together whilst gently warming until water globules are no longer visible, and the mixture is of proper consistence to pour into pots without separating.

For making Cold Cream, as well as for some Ointments, a commercial Wax in thin round cakes, melting about 129° F., is preferable to the B.P. article.

## CERA FLAVA.

### YELLOW WAX.

Prepared from the honeycomb of the Hive-Bee, *Apis Mellifica.*

When quite fresh, is of a golden yellow, but on keeping gets brown.

Sp. g. ·950 to ·970.

**Solubility.**—The same as Cera Alba.

**Tests.**—Should be readily and entirely soluble in hot Oil of Turpentine. Should not yield more than 3 per cent. to cold Rectified Spirit, and nothing to Water or to a boiling solution of Soda, the two latter fluids after filtration neither being turbid nor yielding a precipitate on the addition of Hydrochloric Acid. (Absence of Soap, Fats, Japan

Wax, and Resin.) Boiling Water in which it has been agitated is not, when cooled, rendered blue by Iodine. Melts at 146° F. (63°·3 C.) when tested as follows :—Liquefy a few grains and draw a little of the fluid up into a capillary tube; fix a piece of the capillary tube to the bulb of a thermometer by thread; immerse the bulb and tube in a beaker of Water and heat the latter gently; at the moment the opaque rod of Wax becomes transparent note the temperature. The solidifying point is 2° or 3° lower than the melting point.

Melting point of ten samples taken, with results as follows :—

143°·5, 142°·5, 143°·5, 143°·5, 143°, 142°·5, 144°, 143° 5, 143°·5, 145° F.

(Austr., Belg., Dan., Dutch, Fr. (Cire Jaune), Ger., Hung., Ital., Norw., Port. (Cera Amarella), Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Chiefly used in medicine as an ingredient of plasters and ointments, and is preferable to White Wax for the purpose, the ointments keeping a long time without becoming rancid.

Contained in several of the Emplastra and Unguenta, and in Pilula Phosphori.

### Not Official.

**ASEPTIC WAX.**—Bees Wax, 87; Almond Oil, 12; Salicylic Acid, 1. Melt the Wax and Oil, strain through muslin, add the Salicylic Acid, heat to 150° C. (300° F.) in an oil-bath; pour into stoppered bottles, which have been sterilised, and when cold add to each bottle sufficient aqueous solution of Perchloride of Mercury (1 in 500) to cover the Wax.

This Wax was made by us for Mr. Victor Horsley, who used it for arresting the bleeding of cranial bones, by smudging the Wax on the free, bleeding, cut surface. —*B.M.J.* '92, i. 1165.

## CEREVISIÆ FERMENTUM.

### BEER YEAST.

The ferment obtained in brewing beer, and produced by *Saccharomyces cerevisiæ*; viscid, semi-fluid, frothy, and consists of numerous microscopic round or oval cells.

**Insoluble** in Alcohol or Water.

(Span., Levadura de Cerveza; not in the other Pharmacopœias.)

**Medicinal Properties.**—Antiseptic and stimulant; has been recommended internally as a prophylactic against boils and carbuncles. It has been found useful in obstinate dysentery.

**Dose.**—(Fresh) ½ to 1 oz. every two hours, alone or with Water.

### Preparation.

**CATAPLASMA FERMENTI.**

Beer Yeast, 6; Wheaten Flour, 14; Water, 100° F. (37·8° C.), 6: mix. Place the mass near the fire till it rises.

Useful in foul and sloughing ulcers.

(Not in the other Pharmacopœias.)

# CERII OXALAS.

OXALATE OF CERIUM.

$Ce_2 3C_2O_4, 9H_2O$, eq. 708.

A white granular powder insoluble in Water.

Introduced into practice by Sir James Simpson, of Edinburgh. Cerium was discovered in 1803, and is obtained chiefly from a mineral called Cerite, also containing Lanthanum and Didymium, which are precipitated as Oxalates along with the Cerium.

**Tests.**—10 grains when incinerated at a dull-red heat lose 5·2 grains in weight; the ash (which is of a reddish-brown colour) dissolves completely and without effervescence in boiling Hydrochloric Acid (absence of Carbonates), and the resulting solution gives with Solution of Sulphate of Potassium a white crystalline precipitate (Sulphate of Cerium and Potassium). If the salt be boiled with Solution of Potash and filtered, the filtrate is not affected by Solution of Chloride of Ammonium (absence of Alumina), but when supersaturated with Acetic Acid it gives with Chloride of Calcium a white precipitate (Oxalate of Calcium), which is soluble in Hydrochloric Acid.

In the Alumina test the Chloride of Ammonium must be in excess or the Alumina will not be precipitated.

(Dutch, Oxalas Cerosus; Port. Oxalato de Cerio; Swed., Oxalas Cerosus Venalis; Swiss, Cerium Oxalicum; U.S.; not in the others.)

**Medicinal Properties.**—Sedative, tonic. Of great value in chronic vomiting, and vomiting during pregnancy; also in dyspepsia, gastrodynia, and pyrosis. It has been strongly recommended in sea-sickness, in doses of 10 to 20 grains every three hours. Given with success in spasmodic cough, and the cough of phthisis, and in convulsive diseases, as chorea and epilepsy, it does not produce the discoloration of the skin, as does the use of Nitrate of Silver.

**B.P. Dose.**—1 to 2 grains.

It is taken in 5 to 15 grain doses as a **powder** mixed with a little Water.

It can be safely administered in 10-grain doses 3 times a day for many days in succession; the only unpleasant symptom when so used was slight dryness of the mouth; that appeared after several days. It was most efficacious in the treatment of chronic cough, and the initial dose should be 5 grains. It did not disturb the stomach; on the contrary, relieved nausea and improved digestion. (Conclusions arrived at by the Committee of the New York Therapeutical Society on April 9, 1880, *New York Medical Record*, May 1, 1880.)

# CETACEUM.

SPERMACETI.

A white concrete fatty substance obtained, mixed with Oil, from the head of *Physeter macrocephalus*, or Sperm Whale.

Inhabits the Pacific and Indian Oceans.

Nearly pure Cetine, separated from the Oil by cooling, filtration, and pressure, and afterwards purified.

Cetine or Palmitate of Cetyl, when saponified yields Ethal (the Hydrate of Cetyl) and not Glycerine (the Hydrate of Glyceryl). Most Oils and Fats are Oleates, Palmitates, and Stearates of Glyceryl, which when saponified yield Glycerine and Oleates, Palmitates and Stearates of the metals.

**Solubility.**—Slightly in Rectified Spirit; 1 in 80 of boiling Rectified Spirit; 1 in 6 of Ether; 1 in 1 of boiling Ether, 4 in 5 of Chloroform. Can be reduced to powder by the addition of Rectified Spirit.

**Tests.**—Scarcely unctuous to the touch; melting point 111° to 122° F. (43°·9 to 50° C.), when tested by the method described under Cera Flava.

Melting point of three samples was taken, all three 113° F.

(In all the Pharmacopœias; Fr., Blanc de Baleine; Ital., Cetina; Span., Esperma de Ballena.)

**Medicinal Properties.**—Emollient and demulcent. Has been given in wasting diseases as a substitute for Cod Liver Oil. Externally it is much employed for **ointments** and **cerates.**

**Dose.**—20 to 60 grains two or three times daily.

Contained in Charta Epispastica.

### Preparation.

#### UNGUENTUM CETACEI.

Spermaceti, 5; White Wax, 2: Almond Oil, 20; Benzoin, ½: melt the first three together, add the Benzoin, continue the heat for two hours, frequently stirring the mixture, then strain and stir till cold.

Benzoin is now added, but it converts this emollient preparation into one which is irritating: *see* below.

The Author found 17 of Oil sufficient in summer.

The following are called **Unguentum Cetacei**—(All by weight):—

Dan. Spermaceti 3, White Wax 1, Oil of Almonds 24, Rose Water 12.
Norw. Spermaceti 1, White Wax 1, Oil of Almonds 10, Rose Water 8.
Russ. Spermaceti 3, White Wax 3, Olive Oil 14, Rose Water 2.
Swed. Spermaceti 5, White Wax 4, Oil of Almonds 36, Rose Water 16.

The following are called **Ceratum Cetacei**—(All by weight):—

Austr. Spermaceti, White Wax, Oil of Almonds, equal parts.
Hung. Spermaceti 8, White Wax 8, Lard 9.
Port. Spermaceti 1, White Wax 1, Oil of Almonds 3.
Span. Spermaceti 3, White Wax 2, Oil of Almonds 16, Rose Water 10.
U.S. Spermaceti 2, White Wax 7, Olive Oil 11.

The following are called **Unguentum Leniens**—(All by weight):—

Dutch, Spermaceti 10, Yellow Wax 5, Olive Oil 60, Water 25, Otto of Rose ·05.
Ger. Spermaceti 5, White Wax 4, Almond Oil 32, Water 16, Otto of Rose ·05.

**Unguentum Refrigerans**—(All by weight):—

Swiss, Spermaceti 2, White Wax 1, Almond Oil 12, Rose Water, 25.

**Pomata con Olio di Mandorle**:—

Ital., Spermaceti 1, White Wax 1, Oil of Almonds (by weight) 8.

### Not Official.

**MISTURA CETACEI.**—Spermaceti, 60 grs.; Proof Spirit, 15 minims: finely pulverize the Spermaceti by aid of the Spirit, and add by degrees half the yolk of an egg, at first only sufficient to make a stiff paste, which should be made very smooth by diligent trituration, then add the rest, and make up with Water to 4 ounces.

**Dose.**—1½ oz. Formerly given for coughs and irritation of the bronchial mucous membrane. It was once a constant prescription immediately after delivery.

**UNGUENTUM CETACEI SINE BENZOINO.**—Spermaceti, 5; White Wax, 2; Almond Oil, 18: M.S.A.

The B.P. ointment is unsuited for many purposes for which this ointment is useful, such as **eye** ointments, ointment for Piles, &c.

Used as a cool dressing. Applied on lint to broken blisters from walking, it affords great relief, and frequently enables persons to continue the exercise without serious discomfort. It is also recommended for smearing on the feet before starting for a long walk on rough ground.

# CETRARIA.

ICELAND MOSS.

*B.P.Syn.*—ICELAND LICHEN.

The dried lichen, *Cetraria Islandica*.

It is a native of the north of Europe.

Almost odourless when dry, but when moistened with water has a feeble seaweed-like odour. Taste mucilaginous and bitter. A strong decoction gelatinises on cooling.

It should be freed from pine leaves, mosses, and other lichens, which are frequently found mixed with it.—*U.S.P.*

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed. and Swiss, *Lichen Islandicus*; U.S., Cetraria.)

**Medicinal Properties.**—Demulcent, nutritious, and slightly tonic.

## Preparation.

### DECOCTUM CETRARIÆ.

Iceland Moss, 1: first wash with cold water, then add Distilled Water, 20; boil ten minutes, strain with gentle pressure whilst hot and wash the marc to make 20. =(1 in 20).

**Dose.**—1 to 4 oz.

(U.S., 1 in 20; Belg., 1 in 25; Dutch, 6 in 100; Fr. (Tisane) 1 in 100; Russ., 1 in 32; Span., 1 in 67; not in the others.)

## Not Official.

**SACCHARUM CETRARIÆ.**—Iceland Moss 1, Sugar 1, Water 100. Wash the Iceland Moss with water to remove the bitterness, then boil with 100 of Water, strain and express lightly, and in the strained liquid dissolve the Sugar and evaporate on a water-bath. When sufficiently firm remove from the bath and dry in a cupboard to a powder or scale.

**GELATINA CETRARIÆ.**—Saccharated Cetraria 2, Sugar 1, Water 5. Mix, boil gently till scum collects on the surface, then withdraw the heat, remove the scum, and pour into pots to cool.

(A similar preparation is given in Austr., Belg., Fr., Ital., Norw., Port., Russ., Span. and Swed.)

**PASTILLUS CETRARIÆ.**—Iceland Moss jujubes. Emollient.

**CARRAGEEN.**—*Syn.*—Irish Moss.

The dried *Chondrus crispus.*

Is used as an article of food on the west coast of Ireland, where it abounds. Has been proposed as a substitute for Acacia as an emulsifying agent and for the suspension of some powders.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Fuco Carageo), Norw., Port., Russ., Span., Swed., Swiss and U.S.)

### Preparations.

**SACCHARUM CARRAGEEN.**—Made like Saccharum Cetrariæ.

**GELATINA CARRAGEEN.**—Made like Gelatina Cetrariæ.

(A similar preparation is given in the Austr., Belg., Fr., Norw., Port., Russ. and Swed.)

## CHARTÆ.

CHARTA EPISPASTICA. *See* Cantharis.

CHARTA SINAPIS. *See* Sinapis.

Not Official.

## CHAULMUGRA OIL.

*See* Gynocardiæ Oleum.

## CHIRATA.

CHIRETTA.

The entire plant dried, *Ophelia chirata* (annual), collected when the fruit begins to form.

It is native, and is obtained from Northern India.

The allied species Ophelia Angustifolia and O. Alata, as well as Andrographio paniculata, have frequently been imported into this country as Chirata.—*P.J.* xxi. 837.

(Port. and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—The same as Gentian, but is a purer bitter, without aroma or astringency; given in dyspepsia of gouty subjects.

### Preparations.

**INFUSUM CHIRATÆ.**

Chiretta, cut small, 1; Distilled Water at 120° F. (48°·9 C.), 40; infuse half an hour and strain. =(1 in 40).

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias.)

Salts of Iron may be given in this infusion when a strong bitter is desired as a vehicle.

**TINCTURA CHIRATÆ.**

Chiretta, cut small and bruised, 1; Proof Spirit, 8; macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining Spirit; when it ceases to drop, press the marc, filter, and add Proof Spirit to make 8. =(1 in 8).

**B.P. Dose.**—½ to 2 drms.

Prescribed in 5 minim doses, with acids and tincture of orange to form an acid tonic mixture.

(U.S., 1 in 10; not in the other Pharmacopœias.)

## CHLORAL HYDRAS.

### HYDRATE OF CHLORAL.

$C_2HCl_3O.H_2O$, eq. 165·5.

Chloral, produced by the action of dry Chlorine Gas on anhydrous Alcohol, purified by treatment, first with Sulphuric Acid and afterwards with a small quantity of Lime, and finally converted into the solid hydrate by the addition of Water.

In colourless crystals, which do not deliquesce on exposure to air. It has a pungent but not an acrid odour, and a pungent and rather bitter taste.

**Solubility.**—4 in 1 of Water; 5 in 1 of Rectified Spirit; 2 in 1 of Ether; 2 in 1 of Glycerine; 1 in 1 of Olive Oil; 1 in 3 of Chloroform; 1 in 10 of Oil of Turpentine (cold), 1 in 5 boiling; 1 in 68 of Bisulphide of Carbon.

Extracted from its aqueous solution by shaking out with Ether or Acetic Ether. When in very dilute solution, it may be reduced by the copper-zinc couple and estimated by silver titration.

**Tests.**—The aqueous solution is neutral or but slightly acid to test-paper. A solution in Chloroform, when mixed by agitation with Sulphuric Acid, does not impart colour to the Acid. On the application of a gentle heat it fuses to a colourless transparent liquid, which, as it cools, begins to solidify at a temperature of about 120° F. (48°·9 C.).

Squibb considers the best adjusted point to be 122° F. (50° C.). If the solidifying point be higher, the sample is too much under-hydrated and prone to decompose; if lower, over-hydrated and deliquescent. For good-keeping qualities, it should be slightly under-hydrated.—*Y.B.P.* '76, 166.

It boils in a test-tube, with pieces of broken glass immersed in it, at 202° to 206° F. (94°·4 to 96°·7 C.), and at a slightly higher temperature it volatilises on platinum foil without residue.

A boiling point under 95° C. indicates under-hydration, and the sample is likely to decompose and become acid on keeping, whilst a boiling point above 98° C. indicates an over-hydrated and deliquescent sample. Best commercial specimens begin to boil at about 96°·5 C., quickly rising to 97°, and finally to 98° C. by the time half the liquid has passed over.—*Allen.*

100 grains of Hydrate of Chloral dissolved in an ounce of Distilled Water and mixed with 30 grains of slaked Lime, submitted to careful distillation with a suitable apparatus, should yield not less than 70 grains of Chloroform.

This test is more conveniently conducted in a graduated tube, thus: Place in the tube 250 grain-measures of a 20 per cent. solution of Caustic Potash, and add to it gradually (keeping it cold), 50 grains of the Hydrate of Chloral; cork securely and shake: allow the liquids to separate, and the number of grain-measures of Chloroform (at the bottom), to which must be added 1 for every 200 grain-measures of supernatant liquid, multiplied by 1·5 gives the grains of Chloroform, which should be not less than 35.

(Austr., Ger., Hung., Russ. and Swiss, Chloralum Hydratum; Belg. and Dutch, Hydras Chlorali; Dan., Norw. and Swed., Hydras Chloralicus; Fr., Chloral Hydraté; Ital., Cloralio Idrato; Port., Hydrato de Chloral; Span., Hidrato de Cloral; U.S., Chloral.)

**Medicinal Properties.**—An excellent hypnotic, producing natural and placid sleep soon after its administration. Suitable for hypochondriacal affections, chorea, nervous disturbances, and restlessness, where Opium and Indian Hemp disagree. Good also in asthma and hooping cough. As a hypnotic in fevers, it also diminishes the temperature of the body. Has been found useful in idiopathic tetanus in doses 30 to 60 grains (*L.* '70, ii. 920); also 22 grains every three hours (*L.* '89, i. 1152); also 10 to 20 grains with 20 to 30 grains of Bromide of Potassium (*L.* '87, i. 264).

Of great value in labour, as it relieves the pain without lessening the expulsive power of the uterus. Internally, in the early stages of diphtheria, to remove false membranes (*L.M.R.* '82, 270, and *B.M.J.* '88, i. 1083); also locally, dissolved in Glycerine. Has been recommended in nocturnal incontinence of urine; and children bear it well.—*Ringer.*

Also in delirium tremens.—*B.M.J.* '70, ii. 62.

As an anodyne it is inferior to Opium, but forms a good combination with it.

It is not suitable for subcutaneous injection, as it is likely to produce local inflammation.

It should not be given to a person with a weak heart.

In concentrated solution, applied locally, it acts as a vesicant.

Effects from an overdose or repeated overdoses are cramp in the legs, swimming in the head, flushed face, closed eyes, with injected conjunctiva, and in some cases death.

**Dose.**—5 to 30 grains.

3 oz. will dissolve in 1 oz. of Water, and measure 2 fluid ounces and $5\frac{1}{2}$ drachms; if to this be added 23 minims of Water, every minim will contain a grain of Chloral.

This **solution** is handy for dispensing.

**Incompatibles.**—When prescribed with Alkalies, Chloroform will be liberated.

**Antidotes.**—Stomach pump or emetics; keep up the temperature by hot blankets, hot water bottles, &c.; injection of a pint of hot strong coffee into rectum; electro-magnetism; inhalations of Nitrite of Amyl; in bad cases hypodermic injection $\frac{1}{25}$ gr. of Nitrate of Strychnia; artificial respiration.—*Murrell.*

$\frac{1}{20}$ of a grain of Picrotoxine has been found enough for 30 grains of Chloral.—*B.M.J.* '75, i. 506.

### Preparation.

### SYRUPUS CHLORAL.

Hydrate of Chloral, 80 grains; Distilled Water, 1½ drachm.; Syrup, to make 1 oz.; dissolve the Chloral in the Water and add the Syrup. =(1 gr. in 6 mins.).

Sp. g. about 1·320.

Contains 10 grains of Hydrate of Chloral in 1 fluid drachm.

**Dose.**—½ to 2 drachms.

(Belg. and Fr., 1 in 20, with Peppermint; Port. 1 in 50; Span., 1 in 25; Swiss, 1 in 11. Not in the others.)

### Not Official.

**SUPPOSITORIA CHLORAL.**—Chloral Hydrate, 180 grs.; White Wax, 60 grs.; Oil of Theobroma, 60 grs.: melt together and pour into moulds.

**CHLORAL CUM CAMPHORA** (*B.P.C.*)—Hydrate Chloral 1, Camphor 1: rub together in a warm mortar until completely liquefied, and filter if necessary.

As a **Pigmentum** this formula has appeared for many years in the Pharmacopœias of London, Throat and Westminster Hospitals.

Useful application for the relief of neuralgia.

**CHLORAL CUM CAMPHORA ET COCAINA.**—Chloral Hydrate 5, Camphor 5, Cocaine 1: mix.

For the relief of toothache from dental caries, applied on cotton wool.—*B.M.J.* '86, ii. 131.

**CHLORAL ET PHENOL.**—Chloral Hydrate 1, Carbolic Acid 1: mix.

Is soluble in Water, Rectified Spirit, and Glycerine.

So long as the proportion of Carbolic Acid to Chloral does not exceed 1·7 to 1, the product will mix with Water in all proportions; beyond this limit the excess of Carbolic Acid separates on the addition of Water. As it corresponds to 3 molecular weights to 1, there is probably a chemical combination in these proportions.—*P.J.* xvi. 188.

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### Not Official.

## CHLORALAMID.

A compound of Chloral Anhydride and Formamide.

In colourless crystals. Its aqueous solution should not be heated above 120° F. It is permanent in weakly acidulated solutions, but decomposed by alkalies.

**Solubility.**—1 in 21 of Water; 1 in 2 of Rectified Spirit.

Published solubilities of it in Water have varied considerably. The "Companion" figure (1890) has lately been confirmed (*P.J.* xxii. 805) with the additional note that below 60° F. the solubility decreases very rapidly.—*C.D.* '92, i. 445

(Ger. and Russ., Chloralum formamidatum; not in the others.)

**Medicinal Properties.**—Introduced as a hypnotic. It is stated to have no influence on the pulse, respiration, or temperature. In insomnia with acute pain it is not reliable.

Given in all kinds of insomnia.—*L.* '89, ii. 849, 1192; *L.* '90, i. 339; *B.M.J.* '89, ii. 1326; *M.P.* '89, ii. 571.: *P.J.* xxi. 104; *T.G.* '91, 634, 757; *B.M.J.* '91, i. 1060; *Pr.* xlvii. 274.

Summary of reports, evidence conflicting.—*Medical Annual*, '91, 19.

**Dose.**—20 to 45 grains.

It should not be prescribed with Alkalies, nor be treated with boiling Water.

### Preparation.

**MISTURA CHLORALAMID.**—Chloralamid, 4 drachms; Powdered Sugar, 1 ounce; Proof Spirit to make 4½ ounces.

**Dose.**—3 to 6 drachms, to be taken with Water.

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## CHLORI LIQUOR.

### SOLUTION OF CHLORINE.

Chlorine Gas dissolved in about half its volume of Water, and constituting about ·6 per cent. by weight of the solution.

A yellowish-green liquid, smelling strongly of Chlorine.

Hydrochloric Acid, 6; Black Oxide of Manganese, in fine powder, 1; Distilled Water, 34: put the Manganese into a gas-bottle, pour on it the Acid mixed with 2 of the Water; apply a gentle heat, and pass the gas through a small intermediate wash-bottle containing 2 more of Water into the remainder of the Water contained in a large bottle, which is to be loosely plugged and kept cold till the gas ceases to come over; the bottle should then be closed by the hand and shaken till the gas is absorbed. Keep it in a green glass bottle and in a cool place.

**Tests.**—Sp. g. 1·003. It immediately discharges the colour of a dilute solution of Sulphate of Indigo. Evaporated, it leaves no residue. When 20 grains of Iodide of Potassium, dissolved in 1 ounce of Distilled Water, are added to 1 fluid ounce (439 grains by weight) of this preparation, the mixed solution acquires a deep red colour, which requires for its discharge 750 grain-measures of the volumetric Solution of Hyposulphite of Sodium, corresponding to 2·66 grains of Chlorine. Test explained under CALX CHLORINATA.

(Aqua Chlori, Austr., Belg., ·32 p.c. of Chlorine, Hung. and U.S., ·4 p.c. Ger., Aqua Chlorata (contains ·4 p.c. of Gas); Fr., Chlore Dissous ·68 p.c.; Solutio Chlori, Norw. and Swed., ·32 p.c. and Dutch, ·390 p.c.; Russ. and Swiss, Chlorum Solutum ·4 to ·6 p.c.; Port., Soluto de Chloro; Span., Solucion de Cloro; not in Ital. or Dan.)

**Medicinal Properties.**—Stimulant, antiseptic, and disinfectant. When diluted it is used as a **gargle** in small-pox, scarlatina, diphtheria, and putrid sore throat, and as a **wash** for ulcers, cancerous sores, buboes, and large abscesses. Dr. Scott, of India, gave it for biliary obstructions in conjunction with the Nitro-hydrochloric Acid baths.

**Dose.**—10 to 20 minims, in a wineglassful of water.

**Incompatibles.**—Salts of Lead and Silver.

**Antidotes.**—In case of poisoning by Chlorine Water, the antidotes are White of Egg, Milk, Flour.

**VAPOR CHLORI.** *See* CALX CHLORINATA.

### Not Official.

**LIQUOR CHLORI.**—Chlorate of Potash, 30 grs.; Hydrochloric Acid, ½ oz.; Water to 1 oz.: mix.—*London Hospital.*

## CHLOROFORMUM.

### CHLOROFORM.

$CHCl_3$, eq. 119·5.

It is a colourless, limpid, and volatile liquid, obtained by distillation from a mixture of Chlorinated Lime, Slaked Lime, and weak Spirit, the heat being very carefully applied. The crude Chloroform is washed with Water, strong Sulphuric Acid and Alkaline Water; dehydrated with Chloride of Calcium and quick Lime; redistilled and finally mixed with 1 per cent. by weight of Ethylic Alcohol as a preservative.

Pure Chloroform will not burn, but its vapour colours a Bunsen flame a bright green.

**Solubility.**—10 in 7 of Rectified Spirit; in all proportions of Ether and Alcohol; freely in Olive Oil and Oil of Turpentine. In Water at 32° F. 1 in 150, at 60° F. 1 in 185, at 86° F. 1 in 210, at 113° F. 1 in 200, at 130° F. 1 in 192. Will not dissolve in Glycerine.

Chloroform acts on Vulcanite, and dissolves Caoutchouc, Gutta-percha, Mastic, Elemi, Tolu, Benzoin, and Copal. Amber, Sandarach, Lac, and Wax are only partially soluble. It also dissolves Iodine, Bromine, most of the organic alkaloids, the fixed and volatile Oils, most Resins and Fats. It dissolves Sulphur and Phosphorus sparingly.

**Tests.**—Sp. g. 1·497. It leaves no residue and no unpleasant odour after evaporation. After agitation with Sulphuric Acid the latter is not coloured to any greater extent than that producible by absolute Chloroform to which 1 per cent. of Ethylic Alcohol has been added.

It is recommended that in this test not more than $\frac{1}{10}$ of its volume of Sulphuric Acid should be used, and that in addition to noting the colour, the Acid should be separated, diluted with 3 volumes of Water and the colour and smell again noted. The Acid-treated Chloroform should be washed with Water and the washings titrated with Nitrate of Silver to estimate Chlorine compounds.—*P.J.* xxiii. 229.

It seems generally admitted that absolute Chloroform has sp. g. 1·5, and when containing 1 per cent. of Alcohol should have sp. g. 1·486 instead of 1·497 as stated in B.P.

Air and light combined are the most potent factors for inducing decomposition, and the function of the added Alcohol seems rather to absorb and render inert the products of decomposition than to prevent their formation. Chloroform should be kept as much as possible *in the dark*.

If Chloroform be shaken with $\frac{1}{10}$ volume of Water, the latter should not impart a red colour to blue Litmus paper.—*Dott.*

Fehling's Solution is reduced by Chloroform but not by Alcohol.—*Allen.*

(Austr., sp. g. 1·485 to 1·500; Belg., sp. g. 1·491; Fr., sp. g. 1·500; Dutch and U.S., sp. g. not below 1·490; Dan., Ger., Hung., and Russ., sp. g. 1·485 to 1·489; Ital., sp. g. 1·493; Norw. and Swed., sp. g. 1·485 to 1·493; Port. and Span., sp. g. 1·480; Swiss, sp. g. 1·490.)

**Medicinal Properties.**—Anæsthetic. Internally, a sedative, narcotic, and antispasmodic. The vapour is applied to the eye, and also to the rectum and vagina. Its chief use, however, is to produce anæsthesia by **inhalation** during surgical operations, and the quantity required for each inhalation must depend on the duration of the operation to be performed; but Ether is now considered safer, more particularly for persons with weak heart. With Camphor relieves toothache. Externally, applied immediately after the sting of a wasp, takes away the pain and prevents further mischief. A powerful auxiliary to the Liniments of Aconite, Belladonna, and Henbane.

Chloroform should not be used as an anæsthetic in a room where Gas is being burned.—*C.D.* '91, ii. 858.

Its vapour and aqueous solution are powerfully antiseptic. It preserves vegetable infusions and meat from decomposition.

**B.P. Dose.**—3 to 10 minims.

1 to 5 minims, with yolk of egg and mucilage, in syrup, or in a teaspoonful of brandy. Frequently prescribed in the form of Spirit of Chloroform.

Used in the preparation of Liquor Gutta Percha.

Note.—Chloroform should not be prescribed with weak spirits or Glycerine, as it separates.

Mixed with strong spirits, Camphor Liniment, Soap Liniment, Olive Oil, or Oil of Turpentine, it dissolves perfectly, thus: Chloroform, Oil of Turpentine, of each 1, Soap Liniment 2, make a clear liniment.

**Antidotes.**—In case of overdose of Chloroform, the antidotes are, fresh pure air and artificial respiration (*M.T.* '74, ii. 219), and Nitrite of Amyl (*L.* '75, i. 644).

## Preparations.

### AQUA CHLOROFORMI.

Chloroform, 1 drm.; Distilled Water, 25 oz.: dissolve by shaking. =(1 in 200).

**B.P. Dose.**—½ to 2 oz.; but principally ordered in smaller quantities as a flavouring agent.

(Dan. and U.S. same as Brit.; not in the others.)

### LINIMENTUM CHLOROFORMI.

Chloroform, 1; Liniment of Camphor, 1: mix. =(1 in 2).

The oil in the Camphor Liniment prevents the evaporation of the Chloroform. Stimulating on application to a tender skin.

(Fr., Chloroform 1, Almond Oil 9; Span., Chloroform 1, Compound Oil of Stramonium 9; Swiss, Chloroform 3, Olive Oil 3 (all by weight); U.S, Chloroform 3, Soap Liniment 7; not in the other Pharmacopœias.)

### SPIRITUS CHLOROFORMI.

Chloroform, 1; Rectified Spirit, 19: dissolve. =(1 in 20).

Formerly called Chloric Ether, and of various strengths.

**Test.**—Sp. g. ·871.

**B.P. Dose.**—20 to 60 minims.

10 or 20 minims are frequently prescribed to give sweetness to draughts, and to cover nauseous flavours.

(U.S., Chloroform 6, Alcohol 94; not in the other Pharmacopœias.)

### TINCTURA CHLOROFORMI COMPOSITA.

Chloroform, 2; Rectified Spirit, 8; Compound Tincture of Cardamoms, 10: mix. =(1 in 10).

**B.P. Dose.**—20 to 60 minims. (Same as the Spiritus, which is half the strength.) The Chloroform will separate if this Tincture is prescribed in too little Water. Has been given successfully for the prevention of sea-sickness.

**TINCTURA CHLOROFORMI ET MORPHINÆ.** *N.O.Syn.*—Liquor Chloroformi Compositus.

Chloroform, 2 oz.; Ether, ½ oz.; Rectified Spirit, 2 oz.; Hydrochlorate of Morphine, 16 grs.; Diluted Hydrocyanic Acid, 1 oz.; Oil of Peppermint, 8 mins.; Liquid Extract of Liquorice, 2 oz.; Treacle, 2 oz.; Syrup to make 16 oz.: diffuse the Hydrochlorate of Morphine and Oil of Peppermint in the Spirit, and add the Chloroform and Ether. Mix the Liquid Extract of Liquorice and Treacle with 3 oz. of Syrup, add this to the previously formed solution, mix them thoroughly, add the Hydrocyanic Acid, and increase the volume to 16 oz. by a further addition of Syrup.

**Dose.**—5 to 10 minims.

(Hung. has a "Chlorodyne," but it differs considerably from the above; not in the other Pharmacopœias.)

This formula is obviously founded upon the one given in former editions of the "Companion" under the title of Liquor Chloroformi Compositus, but it contains four times the quantity of Morphine.

The original B.P. instructions read: "dissolve the Hydrochlorate of Morphine and Oil of Peppermint in the Spirit," and when it was discovered that it would not dissolve, the word was changed to "diffuse," but by gently warming the three together a solution is at once obtained which does not precipitate on the addition of the other ingredients. Complete solution may be effected without heat by mixing together the Morphine, Spirit, Oil and Hydrocyanic Acid.

## Not Official.

**CHLOROFORMUM CAMPHORATUM.** (*B.P.C.*)—Camphor, 2; Chloroform, 1: dissolve.

A remedy for toothache, and topically applied for rheumatism.

**TETRACHLORIDE OF CARBON**, sp. g. 1·590. Has been used to produce anæsthesia; its action is said to be effective and pleasant to the patient.

**A.C.E. MIXTURE.**—Rectified Spirit, 1; Chloroform, 2; Ether, 3: mix.

Used as an anæsthetic in place of Chloroform.—*Med. Chir. Trans.* vol. 47, '64, p. 341; *B.M.J.* '87, ii. 975, 1078, 1185, 1314, 1359.

**VIENNA MIXTURE.**—Ether 3; Chloroform 1; by weight.—*P.J.* xii. 703.

"**METHYLENE**" (formerly called Bichloride of Methylene).—Introduced by Dr. Richardson in November, 1867. It is a limpid dense fluid, sp. g. varies; when dropped into Water about one-fourth of it is dissolved, the remainder separates like Chloroform at the bottom of the vessel as a perfectly clear and distinct fluid, and the whole has a sweet pleasant odour, without the least smell of Ether. It is used in the larger operations.

Recommended as an anæsthetic in place of Chloroform.—*B.M.J.* '88, i. 1211, 1301; '88, ii. 72, 203.

**REGNAULD'S ANÆSTHETIC MIXTURE.**—Chloroform 4; Methylic Alcohol 1; mix.

Used as an anæsthetic in the place of Chloroform.—*B.M.J.* '83, ii. 106; '84, i. 452.

# CHRYSAROBINUM.

## CHRYSAROBIN.

*B.P.Syn.*—Araroba Powder; Goa Powder.

The medullary matter of the stem and branches of Andira Araroba, dried, powdered, *and purified;* containing more or less Chrysophanic Acid according to age and condition, and yielding much Chrysophanic Acid by oxidation.

*Commercial Chrysarobin as purified by solvents occurs as* a light brownish-yellow, minutely crystalline powder, tasteless and inodorous. Very sparingly soluble in Water, but almost entirely soluble in 150 parts of hot Rectified Spirit. On heating it melts and partly sublimes in yellow vapours, leaving a charred residue which entirely disappears on ignition in air. It dissolves in Sulphuric Acid to form a yellow to orange-red solution, and in Solution of Caustic Potash to form a yellow to reddish fluorescent solution which becomes carmine by absorption of Oxygen from the air.

The words above printed in italics did not appear in the original issue of B.P. '85, but have been added in the various reprints. The retention, however, of the names of the crude drug as Official synonyms for the purified product, has perpetuated the confusion between the two articles. This will probably be amended in the next B.P. by printing Araroba Powder (*Syn.*—Goa Powder) and Chrysarobin as separate headings, or by omitting the synonyms.

Purified Chrysarobin was introduced into medicine incorrectly as **Chrysophanic Acid**, and it is still known by this name, which, however, only correctly applies to the oxidised product.

**Araroba** yields from 55 to 80 per cent. (average 71 per cent) of **Chrysarobin**. —*P.J.* xxii. 544.

(Austr., Araroba Depurata; Dan., Dutch, Ger., Ital., Russ., Swiss and U.S., Chrysarobinum, the purified product; not in the others.)

**Medicinal Properties.**—It has been found efficient in chronic psoriasis, but as it may cause erythema it requires watching. It stains the skin yellow, also the linen.

**B.P. Dose.**—$\frac{1}{6}$ to $\frac{1}{2}$ grain.

### Preparation.

### UNGUENTUM CHRYSAROBINI.

Chrysarobin, 20 grs.; Benzoated Lard, 480 grs.: melt the Lard, add the Chrysarobin, and stir them together; maintaining a moderate temperature (210° F. is sufficient) so as to promote solution; then remove the heat and stir till cold. =(1 in 25).

(U.S., 1 in 20; not in the other Pharmacopœias.)

### Not Official.

**UNGUENTUM ACIDI CHRYSOPHANICI** (*B.S.H.*).—Purified Chrysarobin, 120 grs.; Lard, 1 oz.: heat together on a water-bath for half an hour, constantly stirring; when set, mix with a pestle and mortar.

**PIGMENTUM CHRYSAROBINI.**—Chrysarobin 60 grs.; Chloroform 10 drms.; pure Gutta Percha 60 grs.; dissolve. Painted on with a stiff brush. Acts effectually, and does not stain the linen.—*B.M.J.* '87, ii. 1139.

It has also been suggested to make Chrysarobin into a **paste** with water, apply this to the skin, and cover it with Collodion.—*M.T.* '82, i. 826.

**CHRYSAROBIN PLASTER MULLS** (Unna).—Contain $\frac{1}{10}$ grain to the square inch; also five times this strength.

**ANTHRAROBIN.**—A substitute for Chrysarobin. A reduction product from Alizarin. Slightly soluble in Water, but readily in Rectified Spirit and solution of Borax. For an **ointment** it is rubbed with Olive Oil and diluted with Lard.

Its action is similar to Chrysarobin, but it is slower and does not produce the same irritation. The part should be previously washed with Potash Soap, and the alcoholic **tincture** is preferred to the ointment. The strength used is 1 in 10.—*B.M.J.* '88, i. 1234; *L.M.R.* '88, 234, and '89, 243.

# CIMICIFUGÆ RHIZOMA.

## CIMICIFUGA.

*B.P. Syn.*—ACTÆÆ RADIX.

Also known as BLACK SNAKE ROOT. BLACK COHOSH.

The dried rhizome and rootlets of *Cimicifuga racemosa.*

Although appearing for the first time in the British Pharmacopœia, it has been known in Pharmacy for years under the name of *Actæa racemosa.*

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Given in nervous diseases, neuralgia, chorea, and rheumatism. Relieves the pain of dysmenorrhœa (*L.* '89, i. 476). It is stated to assist the expulsive action of the uterus (*T.G.* '85, 336).

### Preparations.

### EXTRACTUM CIMICIFUGÆ LIQUIDUM.

Mix 20 of Cimicifuga, in No. 60 powder, with 40 of Rectified Spirit, and macerate forty-eight hours; then pack in a percolator and let it drain, then pour on more Spirit until the Cimicifuga is exhausted. Reserve the first 15 of the percolate, and evaporate the remainder by a water-bath to a soft extract; dissolve this in the reserved portion, and add to it Rectified Spirit to make 20. =(1 in 1).

**Dose.**—3 to 30 minims.

(U.S.; not in the other Pharmacopœias.)

### TINCTURA CIMICIFUGÆ.

Macerate 1 of Cimicifuga, in No. 40 powder, with 6 of Proof Spirit for forty-eight hours, agitating occasionally, pack in a percolator and let it drain, then pour on 2 of Proof Spirit; finally press, filter, and add Proof Spirit to make 8. =(1 in 8).

The Tincture formerly in the Companion as "Not Official" was twice the strength of this, and is still ordered as **Tinctura Actææ Racemosa (Squire)** to distinguish it from the Official preparation.

**B.P. Dose.**—15 to 60 minims.

(U.S., 1 in 5; not in the other Pharmacopœias.)

## CINCHONÆ CORTEX.

CINCHONA BARK.

The dried bark of *Cinchona Calisaya, C. officinalis, C. succirubra, C. lancifolia,* and other species of *Cinchona,* from which the peculiar alkaloids of the bark may be obtained.

The Peruvian Bark was known in Europe as early as 1640, on account of its having cured the Countess of Chinchon of a fever. We are ignorant of its early history, and how the Spaniards in Peru became acquainted with its virtues ; but the Jesuits secretly conveyed it from Peru to Spain—hence it was called the Jesuits' Bark. Little was further known of it until the time of La Condamine, who visited Peru in 1738, and after whom Humboldt and Bonpland named the plant the *Cinchona Condaminea.* It was long supposed that only one species existed; a vast number, however, have been discovered, all of which possess medicinal properties, though varying much, both according to their species and the locality of their growth.

Used in the preparation of Cinchonidinæ Sulphas, Cinchoninæ Sulphas, Quininæ Hydrochloras, Quininæ Sulphas.

Salts of Quinine and Cinchonine may also be obtained from some species of Remijia.

Only Red Cinchona Bark is now official for the Galenical preparations.

The ash was taken of six samples of Cinchona Bark :—Yellow Bark, 2·01 p. c. and 1·67 p. c. ; Pale Bark, 2·95 p. c. ; Red Bark, 3·07 p. c. and 2·06 p. c. ; Cinchona nitida, 2·27 p. c.

(Austr., Dan., Ger. and Russ., any species, especially Succirubra ; Belg., China Flava, China Fusca, China Rubra; Dutch, Cinchona Succirubra ; Fr., Quinquina, any species; Hung., China Calisaya and Succirubra ; Norw. and Swed., Cinchona Calisaya ; Port., Cinchona Flava, Fusca and Rubra; Span., Cinchona Calisaya, Peruviana and Succirubra ; Swiss and Ital., Cinchona Succirubra, Ledgeriana, and Calisaya; U.S., any species of Cinchona, especially Calisaya, Officinalis, and Succirubra ; the latter used for Compound Tincture only.

**Medicinal Properties** —Tonic and antiperiodic, with some degree of astringency. It is especially useful in fevers of a remittent and intermittent character, when it should be given, in full doses, shortly before the cold stage. It has been found highly beneficial in many chronic cases. It is a valuable remedy in neuralgia and in erysipelas, also in convalescence from acute diseases. Powdered Bark has been used as a local application to foul ulcers. (*See also Quinine.*)

An almost white powder was sold in India as the Government Cinchona Febrifuge, which had an average percentage composition of 15·5 crystallisable Quinine, 33·5 Cinchonine, 29 Cinchonidine, 17 Amorphous Alkaloid, 5 colouring matter.

It has been suggested to mix the crystalline salts in the proportion of 4 parts of Sulphate of Quinine, 8 parts of Sulphate of Cinchonidine, 9 parts of Sulphate of Cinchonine.

The results of experiments in India proved that Sulphate of Quinidine was quite equal to Sulphate of Quinine in therapeutic value, and Sulphate of Cinchonidine very nearly so; and that Sulphate of Cinchonine, while possessing valuable febrifuge properties, was in large doses apt to cause nausea, vomiting, and derangements of the bowels, and was not quite so speedy in its action in arresting periodic fevers as the other alkaloids; that in nine-tenths of the fever cases of India, Cinchonidine is just as efficient as Quinine, and only about one-fourth of the cost.—*Cinchona Committee's Report,* 31 August, 1878.

## CINCHONÆ RUBRÆ CORTEX.

### RED CINCHONA BARK.

The dried bark of the stem and branches of cultivated plants of *Cinchona succirubra.*

The Official description reads: "In quills or more or less incurved pieces, coated with the periderm, and varying in length from usually a few inches to a foot or more"; but, as pointed out by Howard (*C.D.* '85, 561), "a vast proportion of the best Red Bark reaches this market either as shavings or crushed by hydraulic pressure in packing and thus not answering the description given."

Attfield is of opinion that this latter form is not adapted for pharmacopœial definition, and that in this case it is the chemical test which must be relied upon; but Umney points out (*P.J.* xvi. 407) that a bark may contain the requisite total alkaloid and the Official percentage of Quinine and Cinchonidine, and still contain only a trace of Quinine. What therefore is really wanted in the Pharmacopœia is a *Quinine-standard* for the bark.

**Tests.**—When used for purposes other than that of obtaining the alkaloids or their salts, it should yield between 5 and 6 per cent. of total alkaloids, of which not less than half shall consist of Quinine and Cinchonidine, as estimated by the following methods:—

1. *For Quinine and Cinchonidine.*—Mix 200 grs. of Red Cinchona Bark, in No. 60 powder, with 60 grs. of Hydrate of Calcium; slightly moisten the powders with half an ounce of Water; mix the whole intimately in a small porcelain dish or mortar; allow the mixture to stand for an hour or two, when it will present the characters of a moist, dark-brown powder, in which there should be no lumps or visible white particles. Transfer this powder to a 6-oz. flask, add 3 fluid oz. of Benzolated Amylic Alcohol, boil them together for about half an hour, decant and drain off the liquid on to a filter, leaving the powder in the flask; add more of the Benzolated Amylic Alcohol to the powder, and boil and decant as before; repeat this operation a third time; then turn the contents of the flask on to the filter, and wash by percolation with more of the Benzolated Amylic Alcohol until the Bark is exhausted. If, during the boiling, a funnel be placed in the mouth of the flask, and another flask filled with Cold Water be placed in the funnel, this will form a convenient condenser which will prevent the loss of more than a small quantity of the boiling liquid. Introduce the collected filtrate, while still warm, into a stoppered glass separator; add to it 20 minims of Diluted Hydrochloric Acid, mixed with 2 fluid drachms of Water; shake them well together, and when the acid liquid has separated this may be drawn off, and the process repeated with Distilled Water slightly acidulated with Hydrochloric Acid, until the whole of the alkaloids have been removed. The acid liquid thus obtained will contain the alkaloids as Hydrochlorates, with excess of Hydrochloric Acid. It is to be carefully and exactly neutralised with Ammonia while warm, and then concentrated to the bulk of 3 fluid drachms. If now about 15 grs. of Tartarated Soda, dissolved in twice its weight of Water, be added to the neutral Hydrochlorates, and the mixture stirred with a glass rod, insoluble Tartrates of Quinine and Cinchonidine will separate completely in

about an hour; and these collected on a filter, washed, and dried, will contain eight-tenths of their weight of the alkaloids, Quinine and Cinchonidine, which, divided by two, represents the percentage of those alkaloids. The other alkaloids will be left in the mother-liquor.

2. *For Total Alkaloids.*—To the mother-liquor from the preceding process add solution of Ammonia in slight excess. Collect, wash, and dry the precipitate, which will contain the other alkaloids. The weight of this precipitate, divided by two, and added to the percentage weight of the Quinine and Cinchonidine, gives the percentage of total alkaloids.

## Preparations.

### DECOCTUM CINCHONÆ.

Red Cinchona Bark, in No. 20 powder, 1¼; Distilled Water, 20: boil ten minutes; when cold, strain, and pour on the marc sufficient Water to make 20. =(1 in 16).

**Dose.**—1 to 2 oz.

(Belg., China Fusca, 1 in 10, also Flava and Rubra 1 in 10; Dan., 1 in 8 with Hydrochloric Acid; Dutch, 6 in 100; Norw., China Calisaya 1 in 10; also 1 in 10 with Sulphuric Acid; Port., Cinchona Flava 1 in 10, also Fusca 1 in 10; Russ., Cinchona Rubra, 1 in 7·5, containing Sulphuric Acid; Span., Quina Calisaya 1 in 46, also Quina ex Loja 1 in 46; not in the others.)

### EXTRACTUM CINCHONÆ LIQUIDUM.

Red Cinchona Bark, in No. 60 powder, 20 oz.; Hydrochloric Acid, 5 drms.; Glycerine, 2½ oz.; Rectified Spirit and Distilled Water of each a sufficiency. Mix the Bark with 5 pints of the Water to which the Acid and Glycerine have been added, and macerate in a covered vessel for forty-eight hours, stirring frequently; then transfer to a percolator, and when the fluid ceases to pass, and the contents of the percolator have been properly packed, continue the percolation with Water until 15 pints of liquid have passed, or that which is passing has ceased to give a precipitate on the addition to it of an excess of Solution of Soda. Evaporate the percolated liquid in a porcelain or enamelled iron vessel at a temperature not exceeding 180° F. (82°·2 C.) until it is reduced to 20 fluid ounces.

Put 50 fluid grains of this liquid (*a*) with half an ounce of Distilled Water into a stoppered glass separator capable of holding 4 fluid ounces; add to this 1 fluid ounce of Benzolated Amylic Alcohol and half a fluid ounce of Solution of Soda, shake them together thoroughly and repeatedly, then allow them to remain at rest until the spirituous solution of the alkaloids shall have separated and formed a distinct stratum over the dark-coloured alkaline solution of the other constituents of the extract. Run off the latter by the stopcock, add a little more Distilled Water to wash away any still adhering alkaline solution from the separator and its contents, and having run off this as before, as completely as possible, decant the spirituous solution into a small porcelain or glass dish the weight of which is known. Evaporate by the heat of a water bath until a perfectly dry residue is left. The weight now of the dish and its contents, after deducting the known weight of the dish, will give that of the alkaloids, and this multiplied by 2 will give the parts by weight of the alkaloids in 100 fluid parts of the liquid (*a*).

Having thus ascertained the alkaloidal strength of the liquid (*a*), every fluid part of it containing five grains of total alkaloids is first to be brought to the volume of eighty-five grains by evaporation, or if necessary by dilution with water, then 12·5 fluid grains of Rectified Spirit are to be added, and the final adjustment of the volume to 100 fluid grains is to be effected by the addition of Distilled Water. The finished liquid extract will thus contain five grains of the alkaloids of the bark in every 100 fluid grains.

Although Redwood was confident that by judicious selection of the bark and the proper treatment according to the process, fully 80 per cent. of the alkaloids might be extracted, the general opinion is that, under ordinary circumstances and average bark, the yield of alkaloid will lie between one-half and two-thirds the total percentage.—*C.D.* '85, 646, 652.

**Dose.**—5 to 10 minims.

(Dan., Dutch, Swiss and U.S., 1 in 1; Solid Extracts.—Austr. and Hung., Aqueous; Dutch, Span. and Swiss, Alcoholic; Belg., Ger., Ital., Port. and Russ., both Aqueous and Alcoholic; not in the others.)

**Ext. Cinch. Fluid. U.S. (Red Bark)** is sometimes prescribed, it means the substitution of Red for the other species used in that formula.

## INFUSUM CINCHONÆ ACIDUM. *B.P.Syn.*—INFUSUM CINCHONÆ.

Red Cinchona Bark, in No. 40 powder, 1; Aromatic Sulphuric Acid, ¼; boiling Distilled Water, 20: infuse one hour, and strain. =(1 in 20).

This replaces the old Infusion made with Yellow Bark without acid.

**Dose.**—1 to 2 oz.

(U.S. (C. any species not Red), 6 in 100, with Aromatic Sulphuric Acid; Russ. (C. Rubra), 1 in 8, with Phosphoric Acid; Fr. (Tisane), 1 in 50; Span., 1 in 46, without acid. Not in the others.)

## TINCTURA CINCHONÆ.

Red Cinchona Bark, in No. 40 powder, 4; Proof Spirit, 20; macerate forty-eight hours with 15 of the Spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining Spirit, and when it ceases to drop, press, and add sufficient Proof Spirit to make 20. =(1 in 5).

The latest experiments (*Y.B.P.* '92, 469) show that 70 or 80 per cent. Alcohol (by volume) is the best menstruum, but unfortunately the average proportion of alkaloid extracted to the total alkaloid in the bark is not stated.

**Dose.**—½ to 2 drachms.

(Belg., Tinctura Chinæ, Tinct. Chinæ Flavæ, Tinct. Chinæ Rubræ; Dutch Tinctura Chinæ Rubræ; Fr., Teinture de Quinquina, Gris, Jaune, also Rouge; Dan., Ger. and Russ., Tinctura Chinæ (from any species); Hung. Tinctura Chinæ Simplex (from C. Succirubra); Ital., Tintura di China; Norw. and Swed., Tinct. Chinæ (from C. Calisaya); Port., Tinctura de Quina (from C. Flava); Span., Tintura Alcoholica de Quina (from C. Calisaya and C. Loja); Swiss, Tinctura Cinchonæ; U.S., Tinctura Cinchona (C. any species not Red); all 1 in 5, and all by weight, except U.S.; not in Austr.)

### TINCTURA CINCHONÆ COMPOSITA.

Red Cinchona Bark, in No. 40 powder, 4 oz.; Bitter Orange Peel, cut small and bruised, 2 oz.; Serpentary Rhizome, bruised, 1 oz.; Saffron, 110 grains; Cochineal, in powder, 56 grains; Proof Spirit, 40 oz.; macerate forty-eight hours with 30 oz. of the Spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remainder of the Spirit; when it ceases to drop, press, and add sufficient Proof Spirit to make 40 oz. =(1 in 10).

**Dose.**—½ to 2 drms.

(Span., resembles Brit., but made with Loxa Bark; Austr., Ger., Hung., and Russ., Tinct. Chinæ Comp., also Belg. (Tinct. Whyttii), and Swiss (Tinct. Cinch. Co.), with Cinchona, Gentian, Orange Peel, and Cinnamon (various strengths); Dan., Dutch, Norw., and Swed. (Tinct. Chinæ Comp.), similar to the above but without Cinnamon; Port. (Tinct. de Quina Comp.), Cinchona, Orange Peel, and Serpentary; U.S., almost the same with Glycerine; not in Fr.)

Huxham's Original Formula for Tincture of Bark in 1788.

Powdered Peruvian Bark, 4 oz.; Orange Peel, 3 oz.; Serpentary Root, 80 grs.; Saffron, 160 grs.; Cochineal, 80 grs.; Brandy, 40 oz.; digest 3 or 4 days.

#### Not Official.

**INFUSUM CHINÆ FRIGIDE PARATUM** (Russ.).—Powder of Red Bark, 18; Distilled Water, 144; Phosphoric Acid (sp. g. 1·130), 1.

## CINCHONIDINÆ SULPHAS.

### SULPHATE OF CINCHONIDINE.

$(C_{20}H_{24}N_2O)_2, H_2SO_4, 3H_2O$, eq. 768.

The sulphate of an alkaloid obtained from the bark of various species of Cinchona. It may be obtained from the mother-liquors of the crystallisation of Sulphate of Quinine by further concentration, purified by crystallisation from alcohol, and finally from hot water.

Colourless silky crystals, usually acicular, which lose 7 per cent. of moisture on drying at 212° F. (100° C.).

The formula given in *Watts' Dict., Supp. p.* 463, contains $6H_2O$, eq. to 13·2 per cent. A sample dried by us at 212° F. lost 12 per cent.

**Solubility.**—1 in 150 of Water; 1 in 4 of boiling Water; 1 in 60 of Rectified Spirit; sparingly in Chloroform; very sparingly in Ether.

**Tests.**—It dissolves in pure Sulphuric Acid with production of not more than a faint yellow coloration, and the fluid undergoes no apparent change when gently warmed. It leaves no ash on ignition; it twists a ray of polarised light to the left. An aqueous solution has a neutral or faintly alkaline reaction; it gives with solution of Tartarated Soda a white precipitate, the filtrate from which is rendered not more than slightly turbid with Solution of Ammonia.

(Fr. and U.S.; not in the others.)

**Medicinal Properties.**—Similar to Quinine but not so powerful.

**Dose.**—1 to 10 grains.

## CINCHONINÆ SULPHAS.

SULPHATE OF CINCHONINE.

$(C_{20}H_{24}N_2O)_2, H_2SO_4, 2H_2O$, eq. 750.

The sulphate of an alkaloid obtained from the bark of various species of Cinchona and Remijia. It may be obtained from the mother-liquors of the crystallisation of the Sulphates of Quinine, Cinchonidine and Quinidine by precipitating the alkaloid with Caustic Soda, washing it with Spirit until free from other alkaloids, dissolving in Sulphuric Acid, and after purifying the solution with Animal Charcoal, allowing to crystallise.

Hard, short, colourless prismatic crystals, which lose 5 per cent. of moisture on drying at 212° F. (100° C.).

A sample dried by us lost 2 per cent. at 212° F., and an additional 1 per cent. at 250° F.

**Solubility.**—1 in 70 of Water; 1 in 17 of boiling Water; 1 in 9 of Rectified Spirit; 1 in 60 of Chloroform; very sparingly in Ether.

**Tests.**—It dissolves in pure Sulphuric Acid without change of colour, and the solution undergoes no apparent change when gently warmed. When 25 grains of the salt is dried at 212° F. (100° C.) it should almost wholly dissolve in 4 oz. by weight of Chloroform. It leaves no ash on ignition and twists a ray of polarised light to the right. An aqueous solution has a neutral or faintly alkaline reaction.

**Dose.**—1 to 10 grains.

(Dutch, Fr., Port., Span., Swed. and U.S.; not in the others.)

## CINNAMOMI CORTEX.

CINNAMON BARK.

The dried inner bark of shoots from the truncated stocks or stools of the cultivated *Cinnamomum Zeylanicum*, imported from Ceylon, and distinguished in commerce as Ceylon Cinnamon.

B.P. states, "A decoction when cool is not coloured by Iodine."

This is not strictly accurate. With a decoction (1 in 10) a dark bluish-grey colour is produced by Tincture of Iodine, which at first disappears on shaking, owing to absorption of the Iodine by the Essential Oil, but is permanent with excess of the reagent.

It is evidently intended to distinguish Cinnamon from Cassia; the latter contains much more Starch, and gives a strong blue reaction with excess of Iodine. The absorption is much less with Cassia than with Cinnamon.

The ash was determined of Cortex and Pulvis Cinnamomi: Cortex (3 samples) 4·26, 4·02, 3·43 per cent.; Pulvis (4 samples) 4·61, 4·8, 5·07, 4·44 per cent.

(Belg., Fr. (Cannelle), Ital. (Cannella), Norw., Port. (Canella), and Swed. use Ceylon Cinnamon only. Austr., Ger., Hung. and Russ., use Chinese Cinnamon or Cassia only. Dan., Dutch, Span., Swiss and U.S. use both kinds.)

**Medicinal Properties.**—Stomachic, carminative, and astringent, chiefly used as an adjuvant to other medicines. Often employed with chalk in diarrhœa.

**Dose.**—10 to 20 grains in powder.

Used in the preparation of Decoctum Hæmatoxyli, Infusum Catechu, Pulvis Catechu Compositus, Pulvis Cretæ Aromaticus, Pulvis Kino Compositus, Tinctura Cardamomi Compositus, Tinctura Catechu, Tinctura Lavandulæ Compositus, Vinum Opii.

## Preparations.

### AQUA CINNAMOMI.

Cinnamon Bark, bruised, 1 ; Water, 16 : distil 8. =(1 in 8).

The distilled "Aqua" is very turbid from suspended Oil. There is no recognised rule in dispensing as to whether it should be filtered or not, but it is customary to do so.

**Dose.**—1 to 2 oz.

(Austr., Belg., Dan., Dutch, Ger., Russ., Swed. and Swiss, 1 in 10 ; Fr. (Eau de Cannelle), and Ital. (Acqua dist. di Cannella), 1 in 4 ; Hung., 1 in 5 ; Port., 1 in 8 ; Norw. and U.S., made with Oil 1 in 500.)

Used in the preparation of Misturæ Cretæ, Guaiaci, and Spiritus Vini Gallici.

### OLEUM CINNAMOMI.

The Oil distilled from Cinnamon Bark.

It is almost identical in composition with Oil of Cassia, both of which consist mainly of **Cinnamic Aldehyde.** Mixed with three or four times its volume of a saturated solution of Bisulphite of Potassium it sets to a crystalline mass.

Sp. g. (several samples taken) 1·022—1·043.

**Solubility.**—10 in 3 of Rectified Spirit ; 1 in 45 of Proof Spirit.

**Test.**—4 drops dissolved in 2 drms. of Alcohol becomes greenish-blue on adding 1 drop of Solution of Ferric Chloride. Oil of Cassia gives a brown colour, and after a short time becomes cloudy.

Possesses the carminative qualities of Cinnamon without its astringency.

**Dose.**—1 to 4 minims in **pill**, or on Sugar.

(Belg., Dutch, Fr. (Huile Volatile de Cannelle), Ital., Port. and Span. use Oil of Cinnamon ; Austr., Dan., Ger., Hung., Norw., Russ., Swed. Swiss and U.S. use Oil of Cassia.)

### PULVIS CINNAMOMI COMPOSITUS. *B.P.Syn.*—PULVIS AROMATICUS.

Cinnamon bark, 1 ; Cardamom seeds, 1 ; Ginger, 1, all in powder : mix. =(1 in 3).

**Dose.**—3 to 10 grains.

(Port. (Pó de Canella Comp.), Cinnamon 7, Cardamoms 7, Ginger 6 ; Pulvis Aromaticus—Belg., Dutch and Swiss, same as Brit. ; Swed., Cinnamon 2, Cardamoms 1, Ginger 1 ; U.S., Cinnamon 7, Ginger 7, Cardamoms 3, Nutmeg 3 ; Russ., Cinnamon 4, Cloves, Mace, Nutmeg, Ginger, of each 1 ; not in the others.)

Used in the preparation of Pilula Aloes et Ferri, and Pilula Cambogiæ Composita.

### SPIRITUS CINNAMOMI.

Oil of Cinnamon, 1 ; Rectified Spirit, 49 : dissolve. =(1 in 50).
Sp. g. about ·839.

**Dose.**—$\frac{1}{2}$ to 1 drm.

(Belg., 1 in 100 ; U.S., 1 in 10 ; Dutch, Ital., Port. and Span. (distilled from the bark) ; not in the others.)

Used in the preparation of Acidum Sulphuricum Aromaticum.

### TINCTURA CINNAMOMI.

Cinnamon bark, in coarse powder, 1; Rectified Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining Spirit; when it ceases to drop, press, and add sufficient Rectified Spirit to make 8. =(1 in 8).

**Dose.**—½ to 2 drms.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Norw., Port., Russ., Span., Swed., and Swiss, 1 in 5; all by weight; U.S., 1 in 10.)

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## COCA.

### COCA.

The leaves of *Erythroxylon Coca,* dried.

They resemble the leaves of tea, but have a slightly visible curved line on each side of the midrib.

Commercially the leaves show two varieties, the Peruvian or Truxillo and the Bolivian or Huanuco. A third variety from Java and other E. I. districts is used to a considerable extent in Germany.

It would appear from the latest investigations on the subject of Coca Leaves and Coca Alkaloids: 1. That the original broad-leaved Bolivian (Huanuco) Coca contained principally Cocaine; 2. That the alkaloid of N. Peruvian or Truxillo Coca is only about one-half Cocaine, a large proportion of the remainder being Cinnamyl-Cocaine; 3. That frequently in Truxillo Coca, and particularly in East Indian (Java), there is another alkaloid around which the controversy still turns. It is called Cocamine by Hesse, and is said to be similar in action to Cocaine, but weaker. Liebermann, however, holds that this Cocamine is the body first called by him Isotropyl-Cocaine and later $\alpha$-Truxilline, and to which he ascribes dangerously toxic properties.

As this latter compound interferes with the crystallisation of the Cocaine, and Cinnamyl-Cocaine is readily detected by the Permanganate test, neither of these impurities is likely to be found in a well-crystallised commercial sample.

(Austr. and Belg., Folia Coca; Fr., Port. and U.S., Coca; Span., Coca del Peru; Swiss, Folium Cocæ; not in the others.)

**Medicinal Properties.**—A nerve stimulant, restorative, and sustenant. It is chewed by the natives of Peru and Bolivia to sustain them during the day, that they may defer eating till the evening.

### Preparation.

### EXTRACTUM COCÆ LIQUIDUM.

Macerate 20 of Coca, in No. 40 powder, with 40 of Proof Spirit for forty-eight hours, pack in a percolator and let it drain, continue the percolation with more of the Spirit until the Coca is exhausted; reserve the first 15 of the percolate, and evaporate the remainder by a water bath to the consistence of a soft extract, dissolve this in the reserved portion, and add sufficient Proof Spirit to make 20.=(1 in 1).

Note.—As the Coca leaves would be but imperfectly exhausted by the first 15 parts of the spirit, and as the active constituents are greatly damaged or destroyed by heat, a fluid extract prepared by repercolation is much to be preferred. When thus prepared from carefully dried green leaves, it contains 25 per cent. of solid Extract (dried at 212° F.).

**Dose.**—½ to 2 drms.

(U.S., same as Brit.; not in the other Pharmacopœias.)

Belg. has solid Extract; French Codex has solid Extract, Tincture 1 in 5, Tisane 1 in 100; Swiss has Tincture 1 in 5.

### Not Official.

**EXTRACTUM COCÆ.**—A solid alcoholic extract, of a green colour, prepared from carefully dried leaves.

**Dose.**—2 to 10 grains.

**VINUM COCÆ.** *Syn.*—VIN DE COCA, Fr.—Dried leaves of Coca 6, Vin de Grenache or Vin Rouge 100: macerate for 6 days and filter.

Wine of Coca can also be made by adding an equivalent quantity of Liquid Extract to Wine.

(Belg. and Fr., 6 in 100; Span., 1 in 30; Swiss, 1 in 20; not in the others.)

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## COCAINÆ HYDROCHLORAS.

### HYDROCHLORATE OF COCAINE.

$C_{17}H_{21}NO_4, HCl$. eq. 339·5.

The Hydrochlorate of an alkaloid obtained from the leaves of *Erythroxylon Coca.*

It may be obtained by agitating with Ether an aqueous solution of an acidulated alcoholic extract, made alkaline with Carbonate of Sodium; separating and evaporating the ethereal liquid, purifying the product by repeating the treatment with acidulated Water, Carbonate of Sodium, and Ether; decolorising, neutralising with Hydrochloric Acid, and recrystallising.

Almost colourless acicular crystals or crystalline powder.

In the original issue of B.P. '85, it was described as readily soluble in Ether, but this was omitted in subsequent reprints.

**Solubility.**—2 in 1 of Water; 1 in 2½ of Rectified Spirit; 1 in 2½ of Glycerine; about 1 in 20 of Chloroform; almost insoluble in Ether; insoluble in Fixed Oils.

**Tests.**—It dissolves without colour in cold concentrated acids, but chars with hot Sulphuric Acid. It leaves no residue on ignition. Its aqueous solution dilates the pupil of the eye; it has a bitter taste, producing on the tongue a tingling sensation, followed by numbness; it gives a yellow precipitate with Chloride of Gold; it should yield little or no cloudiness with Chloride of Barium or Oxalate of Ammonium.

It gives a white precipitate with Solution of Ammonia, insoluble in excess (but which disappears after some time owing to its transformation into soluble decomposition products); it also gives a white precipitate with Carbonate of Ammonium, stated by the B.P. to be soluble in excess, but this is not the case.

**Maclagan Test.**—Dissolve 1 grm. of the salt in 2 oz. of Water and 3 drops of Solution of Ammonia (B.P.) and stir briskly with a glass rod; within a few minutes a crystalline precipitate should be thrown down, leaving no turbidity in the supernatant liquid.

**Permanganate Test.**—A delicate test for the purity of the Salt is to add ½ c.c.

of $\frac{1}{10}$ per cent. solution of Permanganate of Potassium to $\frac{1}{10}$ gramme of the Cocaine Salt dissolved in 5 c.c. of Water acidified with Sulphuric Acid. The colour should not disappear within an hour.

For **melting point** *see P.J.* xxi. 1109, also *A.J.P.* '93, 134.

(Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Russ. and U.S.; not in the others.)

**Medicinal Properties.**—Has been largely used for producing anæsthesia in examinations of and operations on the eye and throat; 2 to 4 per cent. **solutions** being used for the eye and 20 per cent. for the throat. It has also been used for producing anæsthesia of other portions of the mucous membrane, as the rectum, urethra, vagina, ear, and nose. It has been used successfully as a preventive of sea-sickness, in doses of $\frac{1}{4}$ to 1 grain in solution, and in doses of $\frac{1}{8}$ grain every half-hour in the vomiting of pregnancy. The local applications are assisted by subcutaneous injection for producing anæsthesia of the deeper seated tissues for minor operations. Unless a preservative be used solutions should be freshly prepared to avoid the formation of a fungus which has been found in stale solutions, and which has produced injurious effects.

"Dr. Squibb finds from trials extending over six months that ·5 per cent. of Boric Acid protects Solutions of Hydrochlorate of Cocaine from change as thoroughly as ·16 per cent. of Salicylic Acid."—*C.D.* '85, 333.

This does not accord with our experience. 3 per cent. aqueous Solutions of Hydrochlorate of Cocaine containing 1 per 1000 of Salicylic Acid were free from growth after two years. Comparative solutions containing 1 per cent. of Boric Acid in place of the Salicylic Acid, had considerable growth. In fact 1 per cent. of Boric Acid will not preserve Distilled Water for a month, but itself encourages growths.

In operations for piles, *B.M.J.* '85, i. 227; '86, ii. 586; *L.* '86, i. 527; and for fistula, *L.* '87, ii. 793; in prostatic disease, *B.M.J.* '86, i. 822, 999; in parturition, *B.M.J.* '85, ii. 473; *L.* '86, i. 1148; for relief of pain in passing catheter, *B.M.J.* '86, ii. 413; in lithotrity, *B.M.J.* '88, i. 972; '87, i. 589; for scalds, burns, and blisters, *B.M.J.* '85, i. 300; *T.G.* '88, 360; in hay fever, *L.* '85, i. 1021; *B.M.J.* '86, ii. 18; '87, i. 1256; in morphinism, *B.M.J.* '85, ii. 1112; in diabetes, *L.* '89, ii. 735. It is also useful in alcoholism. Toxic effects, *L.* '86, i. 658; *B.M.J.* '85, ii. 971, 983, 1060; '87, i. 617; '88, i. 151, 757.

**B.P. Dose.**—$\frac{1}{5}$ to 1 grain.

**Hypodermic solutions** are used, containing 4 to 10 per cent. of the salt according to the quantity required.

For **external application** in neuralgia, 10 or 20 per cent. solution of the alkaloid in Oil of Cloves.

**Antidote.**—Inhalation of Nitrite of Amyl.—*B.M.J.* '87, i. 625, 695, 1401; *B.M.J.* '88, i. 757.

## Preparations.

### LAMELLÆ COCAINÆ.

Discs of Gelatine with some Glycerine, each weighing about $\frac{1}{50}$ grain and containing $\frac{1}{200}$ grain of Hydrochlorate of Cocaine.

Used in ophthalmic surgery.

### LIQUOR COCAINÆ HYDROCHLORATIS.

Hydrochlorate of Cocaine, 33 grains; Salicylic Acid, $\frac{1}{2}$ grain; Distilled Water to produce 6 fluid drachms: boil the Water, add the

Salicylic Acid, and then the Hydrochlorate of Cocaine; cool and add Water, if necessary, to produce the required volume.

The solution contains 10 per cent. of Hydrochlorate of Cocaine and ·15 per cent. of Salicylic Acid.

We have kept for the last six months without any visible change, both 10 per cent. and 1 per cent. solutions of Hydrochlorate of Cocaine made by dissolving the Salt in a *cold* saturated aqueous solution of Salicylic Acid. If the Water, in the Official formula, is boiled with some idea of sterilising the solution, it would be more consistent to make up at the finish with *boiled* Distilled Water; but as the solutions referred to above were made without heating or any attempt at sterilisation, this does not appear to be of much consequence.—*Companion Supplement*, 1891.

**B.P.Dose.**—2 to 10 miuims.

### Not Official.

**GUTTÆ COCAINÆ HYDROCHLORATIS** (*L.O.H.*).—Hydrochlorate of Cocaine, 10 grs.; Distilled Water, 1 oz.

**COCAINE.**—Crystallises in colourless prisms. Melts at 208° F. (98° C.), and when cooled solidifies to a transparent mass which gradually becomes white and crystalline.

**Solubility.**—About 1 in 1300 of Water (Paul); 1 in 10 of Rectified Spirit; 1 in 12 of Olive Oil; 1 in 4 of Oleic Acid; 2 in 1 of Chloroform; 1 in 4 of Ether; 1 in 14 of Oil of Turpentine. Insoluble in Glycerine.

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## COCCUS.

### COCHINEAL.

The female insect, *Coccus Cacti*, dried; reared on *Opuntia Cochinillifera*, and on other species of *Opuntia*.

When killed by a dry heat the insects are of an ash-grey colour with a silvery surface, but when killed by immersion in boiling water they have a reddish appearance.—*Watts' Dictionary*.

**Test.**—When macerated in Water, no insoluble powder is separated. Ignited with free access of air, not much more than 1 per cent. of ash remains.

(U.S., Coccus; Belg., Swed. and Swiss, Coccionella; Fr., Cochenille; Port., Cochonilha; Span., Cochinilla; not in the others.)

**Medicinal Properties.**—Used chiefly as a colouring agent. Was formerly given in whooping cough.

Used in the preparation of Tinct. Cardamomi Comp., and Tinct. Cinchonæ Comp.

### Preparation.

**TINCTURA COCCI.**

Cochineal, in powder, 1; Proof Spirit, 8: macerate seven days, agitating occasionally; strain, press, filter, and add sufficient Proof Spirit to make 8. =(1 in 8).

**Dose.**—30 to 90 minims twice a day. (Used chiefly for colouring medicines.)

(Fr., 1 in 10; by weight; not in the other Pharmacopœias.)

### Not Official.

**CARMINE.**—Prepared from Cochineal, an excellent colouring agent for powders and ointments. It is also used as a staining agent in microscopy.

**LIQUOR CARMINI** (*U.S.N.F.*).—Carmine, 480 grs.; Water of Ammonia, 6 fl. oz.; Glycerine, 6 fl. oz.; Water sufficient to make 16 fl. oz.

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# CODEINA.

## CODEINE.

$C_{18}H_{21}NO_3, H_2O$, eq. 317.

An alkaloid contained in Opium. It is separated from the ammoniacal liquors from which Morphine has been obtained, by evaporating, treating the residue with Water, precipitating with Caustic Potash and purifying the precipitated alkaloid by recrystallisation from Ether. Colourless or nearly colourless octahedral crystals; its aqueous solution has an alkaline reaction and a bitter taste.

**Solubility.**—1 in 80 of Water; 1 in 24 of boiling Water; 1 in 2 of Rectified Spirit; 1 in 2 of Chloroform; 1 in 30 of Ether; 1 in 12 of Benzol.

**Tests.**—It dissolves in Sulphuric Acid, forming a colourless solution which when gently warmed with a small fragment of Molybdate of Ammonium or a trace of Perchloride of Iron assumes a deep blue colour. Moistened with strong Nitric Acid it becomes yellow, but not red. Yields no ash on ignition.

(Belg., Dan., Dutch, Fr., Hung., Ital., Port., Russ., Span., Swed., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—It has been given with benefit in diabetes (an entire abstinence of starchy food being strictly observed) in doses of 1 grain three times a day, gradually raised to 2 grs. It has also been given in chronic laryngitis.

It has a powerful action in allaying abdominal pain and it can be pushed to a much greater extent than Morphine without causing drowsiness or interfering with the respiration or with the action of the bowels.—*B.M.J.* '88, i. 1214.

**Dose.**—$\frac{1}{4}$ to 2 grs.

### Not Official.

**SYRUPUS CODEINÆ** (*B.P.C.*).—Codeine, 8 grs.; Proof Spirit, $\frac{1}{2}$ oz.; Water, $\frac{1}{2}$ oz.; dissolve and add Syrup to make 8 oz.

This is the same strength as in former editions of the Companion, half the Water being replaced by Proof Spirit.

**Dose.**—1 to 2 teaspoonfuls for a cough.

(Ital. and Swiss, 1 in 500; not in the others.)

**CODEINE PASTILS.**—Jujubes containing $\frac{1}{8}$th grain of Codeine in each. One for a dose when the cough is troublesome.

An improvement on Codeine Jelly.

(Ital., $\frac{1}{13}$ grain in each.)

**CODEINÆ PHOSPHAS.**—The most soluble salt of Codeine. It dissolves 1 in 4 of Water; but it is precipitated, after a time, by the addition of Rectified Spirit.

(Ger., Russ. and Swiss; not in the others.)

## COLCHICI CORMUS.*

COLCHICUM CORM.

The fresh corm of *Colchicum autumnale,* collected about the end of June or early in July; and the same stripped of its coats, sliced transversely, and dried at a temperature not exceeding 150° F. (65°·5 C.).

Contains about ·5 per cent. of **Colchicine.**

(Fr., Ital., Port., Span. and U.S.; not in the others.)

**Medicinal Properties.**—Produces increased action of the kidneys and intestinal glands; the action of the skin is also increased, and the power of the heart diminished. Employed chiefly in gout, controlling the pain and inflammation. Affords relief in acute rheumatism and other inflammatory affections. May be used combined with other purgatives in cases of imperfect action of the liver. It has also been used in dropsy. It is apt to produce depression if given on an empty stomach. The Acetic Extract is frequently prescribed with Dover's Powder to relieve painful gout.

*In very large doses Colchicum is a powerful stimulant of the liver and intestine. It renders the bile more watery, but increases the secretion of biliary matter proper.—Dr. Rutherford.*

**Incompatibles.**—Tincture of Iodine, Guaiacum, and all astringent preparations.

**Antidotes.**—In case of poisoning with Colchicum, emetics followed by demulcent drinks, and, if coma be present, Brandy, Ammonia, Coffee, and other powerful stimulants may be given. Hypodermic injection of $\frac{1}{2}$ gr. of Morphine.

### Preparations.

### EXTRACTUM COLCHICI.

The expressed juice of fresh Colchicum Corms (deprived of their coats), cleared of deposit, heated to 212° F. (100° C.), strained, and evaporated to a pill consistence at a temperature of 160° F. (71°·1 C.).

100 pounds of Corms yield about 4 pounds of Extract.

**Dose.**—$\frac{1}{2}$ to 2 grs.

(Not in the other Pharmacopœias. Belg. and Fr., Alcoholic Extract of Seeds; Span., Alcoholic from Corms; Swiss has **Fluid Extract** of Seeds; U.S., **Fluid Extracts** of Corms and Seeds.)

### EXTRACTUM COLCHICI ACETICUM.

Fresh Colchicum Corms, deprived of their coats, 112; Acetic Acid, 6: crush the Corms, add the Acetic Acid, press out the juice, and after subsidence heat the clear liquor to 212° F. (100° C.), strain through flannel, and evaporate by a water-bath at a temperature not exceeding 160° F. (71°·1 C.) to the consistence of soft extract.

100 pounds of Corms yield about 5 pounds of Extract.

**Dose.**—$\frac{1}{2}$ to 2 grs., in pill, with an equal weight of Liquorice Powder.

(Port. and U.S.; not in the other Pharmacopœias.)

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* It is biennial. The young corm (an offset of the old one) first appears about the end of June; it flowers late in autumn, the impregnated germen remains latent under ground quite close to the bulb until the following spring, when the capsule rises above the surface, accompanied by several long upright leaves, the seeds ripening in June; after which the leaves decay. The corm is considered to be most active when it is a year old, that is about July.

### VINUM COLCHICI.

Colchicum Corms, sliced, dried, and reduced to No. 20 powder, 4; Sherry, 20; macerate seven days, agitating occasionally, strain, press, and add Sherry to make 20. =(1 in 5).

**Dose.**—10 to 30 minims.

(U.S., 1 in 2·5 White Wine; Fr., 1 and 10 Malaga; Ital., 1 and 10 Marsala; Port., 1 and 10 Madeira; Span., 1 and 16·6 Sherry.)

## COLCHICI SEMINA.

COLCHICUM SEEDS.

The seeds, when fully ripe, of *Colchicum autumnale*, carefully dried (gathered about the end of July or beginning of August).

Pharmacographia ('74 edition) mentions that the alkaloid "is said to amount to only about ·05 per cent.," but this is omitted in the later edition ('79). Fletcher (*C.D.* '91, i. 238) found ·012 per cent. in the Tincture, and Farr (*P.J.* xxi. 340) about ·01 per cent., but these results proved of no value owing to the use of Chloroform instead of Petroleum Ether in the acid washing.

In last "Companion" edition we mentioned that "Four samples examined for total alkaloids yielded ·608, ·660, ·872, 1·09 per cent.; the Tincture should be standardised." These results have been fully confirmed by the later results of Wright and Farr noted below.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Similar to those of the corm, but considered by some to be superior both in certainty of effect and mildness of operation.

### Preparation.

### TINCTURA COLCHICI SEMINUM.

Colchicum Seeds, finely comminuted, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator, and let it drain, then pour on the remainder of the Spirit; when it ceases to drop, press, filter, and add sufficient Proof Spirit to make 8. =(1 in 8).

When possible, it should be filtered at a low temperature to prevent after-separation of the oil.

**Dose.**—10 to 30 minims.

According to the experiments of Wright and Farr (*P.J.* xxi. 957) the best yield of alkaloid was obtained by 50 per cent. Alcohol (by volume); the average percentage in (1 in 8) tinctures from 10 samples of ground Seeds was ·0857, which is equivalent to ·685 per cent. in the Seeds, supposing these to be completely exhausted.

From the unbroken Seeds *cold* Alcohol only extracts about one-third of the alkaloid (*P.J.* viii. 507), corroborated by Cripps (*P.J.* xxii. 364).

From the unbroken Seeds *hot* (80° C.) diluted Alcohol (sp. g. ·941) extracts the whole of the alkaloid in a few hours.—*P.J.* xi. 734.

(Austr., 1 in 10; Belg., Fr., Hung. and Port., 1 in 5; Dutch, Ger., Russ., Swed. and Swiss, 1 in 10; U.S., 15 in 100: all from Seeds. Port. and Span., 1 in 5 with Corms: all by weight except U.S.; not in the others.)

### Not Official.

**TINCTURA COLCHICI COMPOSITA** (*P.L.*).—Colchicum Seeds, bruised, 1; Aromatic Spirit of Ammonia, 8: macerate for seven days, then press and strain.

**Dose.**—15 to 30 minims.

**TINCTURA COLCHICI FLORUM.**—Fresh Flowers, 2; Rectified Spirit, by weight, 1: digest seven days.

It will yield on the average ·1 per cent. of total alkaloid.

**Dose.**—10 to 30 minims. This preparation closely resembles the Eau Médicinale, and is considered by some medical men to be the most effective preparation of any.

**VINUM SEMINIS COLCHICI.**—Colchicum Seeds in fine powder, 1; Sherry, 10: macerate for seven days, agitating occasionally, strain, press, and filter.

(Austr. and Dutch, 1 and 10 Malaga; Hung., 1 in 5 Malaga; Belg., 1 and 16·6 Malaga and Spirit; U.S., 15 in 100 White Wine; Dan., Ger., Norw. and Russ., 1 and 10 Sherry; Fr., 1 and 16·6 Malaga; Port., 1 and 10 Madeira; Swiss, Fluid Extract 1 in 10 Marsala; all by weight except U.S.)

### Not Official.

## COLLINSONIA.

The root of *Collinsonia Canadensis.*

Various preparations of this have been recommended in acute cystitis and in the treatment of renal calculi.—*B.M.J.* '87, ii. 712; *L.* '88, i. 68.

### Preparation.

**TINCTURA COLLINSONIÆ.**—Collinsonia Root, 1; Proof Spirit, 10.

**Dose.**—30 to 120 minims.

## COLLODIUM.

### COLLODION.

Pyroxylin, 1; Ether, 36; Rectified Spirit, 12: mix the Ether and Spirit, and add the Pyroxylin. In a few days, should there be any sediment, decant the clear solution. Keep it in a well-corked bottle.

Mixes with Ether; but when mixed with Water or Rectified Spirit the Pyroxylin is thrown out.

**Tests.**—Colourless and highly inflammable, with ethereal odour; it dries rapidly upon exposure to the air, and leaves a thin transparent film, insoluble in Water or Rectified Spirit.

Poured on the skin, it contracts in drying.

(Austr. and Hung., proportions not given; Belg., Pyroxylin 1, Ether 20, Rectified Spirit 2½, Castor Oil 1½; Dutch, Pyroxylin 3, Ether 80, Rectified Spirit 17; Fr., Pyroxylin 1, Ether 15, Spirit 4; Dan., Ger., Russ. and Swiss, Pyroxylin 1, Ether 21, Rectified Spirit 3; Ital., Pyroxylin 1, Alcohol 4, Ether 12; Norw., Pyroxylin q.s., Ether 6, Rectified Spirit 1; Port., Pyroxylin 1, Ether 14, Rectified Spirit 4, Castor Oil 1; Span., Pyroxylin 1, Ether 25, Rectified Spirit 3; Swed., Pyroxylin 1, Ether 35, Rectified Spirit 5; U.S., Pyroxylin 3, Stronger Ether 75, Rectified Spirit 25: all by weight except U.S.)

### Preparations.

**COLLODIUM FLEXILE.** (COLLODIUM ELASTICUM in foreign Pharms.)

Collodion, 12 fl. oz.; Canada Balsam, ½ oz. (by weight); Castor Oil, ¼ oz. (by weight): mix.

It does not contract in drying.

(Austr., Russ. and Swiss, Collodion 49, Castor Oil 1; Dan., Collodion 99, Castor Oil 1; Dutch, Collodion 96, Castor Oil 4; Fr., Collodion 15, Castor Oil 1; Ger., Collodion 94, Turpentine 5, Castor Oil 1; Hung., Collodion 50, Castor Oil 1; Ital., Collodion 97, Castor Oil 3; Norw. and Swed., Collodion 100, Glycerine 1; Span., Collodion 10, Castor Oil 1; U.S., Collodion 92, Canada Turpentine 5, Castor Oil 3; Belg. (Collodium), and Port. (Collodio), both contain Castor Oil. *See* COLLODIUM.)

**Medicinal Properties.**—Chiefly used for coating with a protecting film diseased or wounded parts; it has been recommended as an application to erysipelas, burns, boils, and to prevent the pitting of smallpox. A large number of substances can be dissolved in Collodion to form medicated Collodions; some of these are noticed under other headings.

**COLLODIUM VESICANS (BLISTERING COLLODION).**—*See* CANTHARIS.

### Not Official.

**STYPTIC COLLOID** (DR. RICHARDSON'S).—A Saturated Solution of Tannic Acid and Xyloidine or Gun-Cotton in Absolute Alcohol and Pure Ether. In the first step of the process, the Tannic Acid, rendered as pure as it can be, is treated with Absolute Alcohol, and digested in it for several days. Then the Pure Ether, also absolute, is added until the whole of the thick Alcoholic Mixture is rendered quite fluid. Lastly the Xyloidine is added until it ceases readily to dissolve. A little Benzoin may be added to give an agreeable odour to the Colloid.

It can be applied directly with a brush, or mixed with an equal quantity of Ether, and used in the form of **spray**.

**HÆMOSTATIC COLLODION** (Dr. PAVESI'S).—Collodion, 100; Carbolic Acid, 10; Tannic Acid, 5; Benzoic Acid, 5: dissolve. Is applied by means of a pencil, or by soaking strips of linen in it.

**COLLODIUM SALICYLICUM.**—*See* ACIDUM SALICYLICUM.

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# COLOCYNTHIDIS PULPA.

## COLOCYNTH PULP.

The dried peeled fruit, freed from the seeds, of *Citrullus Colocynthis*.

The fruit is imported chiefly from Smyrna, Trieste, France and Spain.

**Tests.**—The powder is not coloured blue by Iodine, and does not yield Oil when treated with Ether and the separated Ether evaporated.

These tests are intended to exclude: 1. Adulteration with Starch, which of course need not be expected in dealing with any respectable drug-house; 2. Imperfect separation of Seeds. This latter is the point most worthy of attention in connection with Colocynth. According to Tichborne the unpeeled fruit consists of Seeds (inert) 47 per cent., Rind (almost inert) 34 per cent., Pulp (active) 19 per cent., (*Y.B.P.* '78, 564). The decorticated Pulp will therefore contain 71 per cent. of Seeds.

A sample of very fine decorticated Colocynth examined by us in 1878 yielded 66 per cent. of Seeds.

The removal of the Seeds commercially is carried out very imperfectly; we have bought Colocynth Pulp from wholesale houses in London containing from 4 per cent. up to 33 per cent. of Seeds, 10 per cent. being quite a common figure. Now, as the Seeds contain about 15 per cent. of Oil (they are stated (*Y.B.P.* '78, 565) to contain 50 per cent.), it is doubtful whether a single trade sample could be found which would pass the Official Ether test, even on the supposition that the Pulp itself was free from Ether soluble constitutents. But the Pulp *perfectly freed from Seeds* does yield to Ether about 3 per cent. of extractive of an oily nature, so that the Official test should be completely modified. If complete separation of Seeds be insisted upon, the Ether extractive should not exceed 4 per cent., but a maximum of 5 per cent. would probably serve all practical purposes. This would allow about 10 per cent. of Seeds supposing them to contain 15 per cent. of Oil.

The proportion of ash as indicated in "Companion," 1886, also furnishes a good test. We have found the ash of the Pulp to vary between 8·6 and 14 p. c., and that of the Seeds between 2·2 and 4 p. c.; on these figures Colocynth Pulp with an allowable 10 p. c. of Seeds would yield not less than 8 p. c. of ash. It should be noted that the ash both of Pulp and Seed is very deliquescent.

(Austr., Belg., Dan., Dutch, Fr. (Coloquinte), Ger., Hung., Ital. (Coloquintide), Norw., Port. (Coloquintidas), Russ., Span. (Coloquintida), Swed., Swiss and U.S.)

**Medicinal Properties.**—It is a powerful drastic hydragogue cathartic, dangerous in large doses; but very commonly prescribed as an aperient, in the form of Compound Extract or Pill combined with Henbane. The Tincture is ordered in Mixtures.

*In large doses a powerful hepatic as well as intestinal stimulant; it renders bile more watery, but increases the secretion of biliary matter.—Dr. Rutherford.*

**Dose.**—2 to 8 grains. Seldom prescribed alone.

## Preparations.

### EXTRACTUM COLOCYNTHIDIS COMPOSITUM.

Colocynth Pulp, free from Seeds, 6; Extract of Socotrine Aloes, 12; Resin of Scammony, in powder, 4; Curd Soap, in powder, 3; Cardamom Seeds, in the finest powder, 1; Proof Spirit, 160: macerate the Colocynth in the Spirit for four days; press out the tincture, distil off the Spirit, and add to it the Aloes, Soap, and Scammony; and evaporate by a water-bath to a pill consistence, adding the Cardamoms towards the end of the process.

The product weighs 24, therefore in every 6 of Extract. Coloc. Compos. there is the power of 1½ of Pulp = Simple Extract ½, Extract of Aloes 3, Resin of Scammony 1, Curd Soap ¾, Cardamoms ¼, Water ½.

Better to evaporate the Colocynth Extract right down to dryness, powder it, and mix with the other ingredients to form Pulv. Ext. Coloc. Co.

**B.P.Dose.**—3 to 10 grains.

Commonly prescribed with Extract of Hyoscyamus, to prevent griping.

(Port., Colocynth 30, Aloes 55, Scammony 22, Hard Soap 15, Cardamoms 3; Span., contains Colocynth, Aloes, Scammony, and six other ingredients; Swed., Colocynth 5, Aloes 10, Scammony 3, Cardamoms 1, Soap 2; Swiss, Extract of Colocynth 2, Extract of Aloes 10, Scammony 4, Cardamoms 1, Soap 3, Russ., Extract Colocynth 3, Aloes 10, Scammony 8, Extract of Rhubarb 5; U.S., Extract Colocynth 16, Purified Aloes 50, Resin Scammony 14, Cardamoms 6, Soap 14: not in the others.)

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Russ., Swiss and U.S., have Simple Extract made with Alcohol.)

## PILULA COLOCYNTHIDIS COMOPSITA.

Colocynth Pulp, in powder, 1; Barbadoes Aloes, in powder, 2; Resin of Scammony, in powder, 2; Sulphate of Potassium, in powder, ¼; Oil of Cloves, ¼; Distilled Water, a sufficiency (about ¼): mix. =(about 1 in 6).

For dispensing, keep the powders ready mixed, and make up the mass as required with Water, or better still, Proof Spirit.

**B.P.Dose.**—5 to 10 grains. (Dr. Gregory's favourite pill.)

The *minimum* dose is somewhat high, as it is frequently prescribed in smaller doses than 5 grains. The same may be said of the next pill, which is only two-thirds of the strength.

(Fr., Colocynth in powder 10, Aloes 10, Scammony 10, Honey q.s., Oil of Cloves ·2; Norw., Colocynth 12, Aloes 4, Scammony 4, Oil of Cloves ⅔, Suet 3, Glycerine 3; Span., Compound Extract of Colocynth 20, Extract of Colchicum 20, Extract of Opium 1; Swed., Compound Extract of Colocynth 7, Cloves 1, Jalap 2, Extract of Wormwood q.s. Not in the other Pharmacopœias.)

## PILULA COLOCYNTHIDIS ET HYOSCYAMI.

Colocynth Pulp, in powder, 1; Barbadoes Aloes, in powder, 2; Resin of Scammony, in powder, 2; Sulphate of Potassium, in powder, ¼; Oil of Cloves, ¼; Extract of Hyoscyamus, 3; Distilled Water, a sufficiency: mix. =(Pil Coloc. Co. 6; Extr. Hyos. 3).

**B.P.Dose.**—5 to 10 grains. (Dr. Christison's favourite pill.)

(Not in the other Pharmacopœias.)

### Not Official.

**TINCTURA COLOCYNTHIDIS.**—Colocynth Pulp, in coarse powder, 1; Rectified Spirit, 10.

**Dose.**—10 to 15 minims three times a day.

(Belg. and Hung., 1 in 5; Russ. and Swiss, 1 in 10; Ger., Fruits 1, Alcohol 10; Norw., and Swed., 1 in 10, with Anise Fruits $\frac{1}{10}$; Dutch, 1 in 14, with ⅛ Anise Fruits.)

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### Not Official.

## CONDURANGO CORTEX.

The bark obtained from *Gonolobus condurango.*

(Austr., Dan., Dutch, Ger. and Russ.; not in the others.)

**Medicinal Properties.**—It was introduced as a remedy for cancer, but it has not fulfilled the expectations formed of it. It relieves catarrh and hyperæsthesia of the stomach, and has been used with benefit in cancer of the stomach.—*L.M.R.* '88, 337.

# CONFECTIONES.

## CONFECTIONS.

The following are now contained in the British Pharmacopœia, the formulas for which will be found under the names of the substances from which they are prepared:—

CONFECTIO OPII. 1 of powder of Opium in 40. Dose 5 to 20 grs.
CONFECTIO PIPERIS. Dose, 1 to 2 drms.
CONFECTIO ROSÆ CANINÆ. } Dose, 1 drm. or more.
CONFECTIO ROSÆ GALLICÆ. } Dose, 1 drm. or more.
CONFECTIO SCAMMONII. Dose, 10 to 30 grs.
CONFECTIO SENNÆ. Dose, 1 to 2 drms.
CONFECTIO SULPHURIS. Dose, 1 to 2 drms.
CONFECTIO TEREBINTHINÆ. Dose 1 to 2 drms. for adults, 1 drm. for children.

# CONII FOLIA.

## HEMLOCK LEAVES.

*N.O.Syn.*—Cicutæ Folia. Cigue Feuille.

The fresh leaves and young branches of *Conium maculatum* from wild British plants when the fruit begins to form.

**Test.**—The leaf rubbed with Solution of Potash gives out strongly the odour of Conine.

(Belg. and Fr., Leaves; Austr., Dutch, Ger., Ital., Norw., Port., Russ., Span. and Swed., Herb; not in Dan., Hung., Swiss or U.S.)

**Medicinal Properties.**—Anodyne and antispasmodic; allays the cough in bronchitic affections, pertussis, and phthisis. Has also been recommended in chorea. Applied externally in the form of a **cataplasm** or **ointment** to ease pain, especially in cancer.

**Dose.**—2 to 8 grs. in powder.

**Incompatibles.**—Caustic Alkalies, Vegetable Acids, and Astringents.

**Antidotes.**—In case of poisoning by Hemlock, emetics followed by stimulants internal and external, artificial respiration long continued.

### Preparations.

**CATAPLASMA CONII.**

Juice of Hemlock, 1 oz.; Linseed Meal, 4 oz.; boiling Water, 10 oz.: evaporate the Hemlock Juice to half its volume, add this to the Linseed Meal and Water previously mixed, and stir them together.

(For 1 Cataplasm).

(Span., Powdered Hemlock 6, Linseed Meal 6, Water 35; not in the other Pharmacopœias.)

**EXTRACTUM CONII.** *N.O.Syn.*—Extractum Cicutæ.

Inspissated juice of the fresh plant, prepared as directed for Extractum Belladonnæ.

100 lbs. plant yield 50 lbs. juice = from 55 to 60 oz. Extract; 100 lbs. leaves, when dried, weigh 21 lbs.

Allen gives the proportion of Alkaloid in Extract as ½ to nearly 3 per cent. Our stock in 1889 contained ·75 per cent. of **Conine.**

Harley (*P.J.* i. 589) states that the maximum dose (6 grains) cannot possibly contain more than ·084 grain of Conine, a quantity insufficient to produce hemlock effects in a child two years old, while 60 grains at least are required to produce slight effects in a healthy adult.

**Dose.**—2 to 6 grains.

(Austr., alcoholic from **dried herb**; Belg. (*E. Cicutæ*), juice from **leaves** evaporated and mixed with an equal quantity of alcohol, filtered and evaporated; Dutch, alcoholic from **fresh herb**; Fr., from clarified juice of **fresh leaves,** also alcoholic from **fruits**; Ital., clarified juice of **fresh leaves** evaporated; Port., clarified juice of **fresh herb** evaporated, also alcoholic from **fresh plant,** also the same purified again with alcohol; Russ., aqueous from **herb**; Span., clarified juice of **fresh herb** evaporated, also aqueous from **dried leaves,** also alcoholic from **dried leaves**; Swed., alcoholic from **herb**; Swiss, 1 Extract = 2 of Fruit; also **Fluid Extract** 1 in 1; U.S., from **fruits,** with alcohol acidified with Acetic Acid, also **Fluid Extract**; not in Dan., Ger., Hung. or Norw.)

### PILULA CONII COMPOSITA.

Extract of Hemlock, 5; Ipecacuanha, 1; Treacle sufficient to form a mass.

**Dose.**—5 to 10 grains.

(Not in the other Pharmacopœias.)

### SUCCUS CONII.

Express the juice from bruised fresh leaves; to every 3 measures of juice add 1 of Rectified Spirit. Filter after seven days. Keep in a cool place.

12 minims = 1 grain of Extract.

**Dose.**—30 to 60 minims.

Attention has been called in medical journals to the uselessness of these doses. It may be prescribed by the ounce.

(Not in the other Pharmacopœias.)

### UNGUENTUM CONII.

Juice of Hemlock, 2 oz.; Hydrous Wool Fat, ¾ oz.; Boric Acid, in fine powder, 10 grains; evaporate the Juice to 2 drachms at a temperature not exceeding 140° F. (60° C.); add the Boric Acid and the Hydrous Wool Fat, and mix thoroughly. =(2 Juice in 1).

Contrary to what might have been expected, the alkaloidal strength of the Juice is not affected by the evaporation.

### VAPOR CONINÆ.—INHALATION.

Juice of Hemlock, 1 oz.; Solution of Potash, 2 drs.; Distilled Water, 2 oz.: mix.

Put 20 minims of the mixture on a sponge, in a suitable apparatus, so that the vapour of hot Water passing over it may be inhaled.

## CONII FRUCTUS.

HEMLOCK FRUIT.

*N.O.Syn.*—Cicutæ Fructus. Cigue Fruit.

The fruit of *Conium maculatum*, gathered when fully developed, but while still green, and carefully dried.

The alkaloidal value of the fruits appears to be as variable as the leaves. Some estimations published (*C.D.* '92, ii. 401) gave ·17 to ·91, average ·58 per cent. of Conine.

(Belg., Fr., Port., Span., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Used in the same cases as Conii Folia.

### Preparation.

### TINCTURA CONII.

Hemlock Fruit, finely comminuted, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining Spirit; when it ceases to drop, press, mix, filter, and add sufficient Proof Spirit to make 8. =(1 in 8).

**Dose.**—20 to 60 minims.

From the experiments of Wright and Farr (*P.J.* xxi. 858) it would appear that after eliminating one sample of evidently damaged seed, the percentage of alkaloid in ten samples of Tincture averaged ·0854 (corresponding to ·683 per cent. in the fruit). The percentages were very variable, being ·064 to ·157. Alcohol 70 to 80 per cent. by volume is the best alkaloidal solvent, and a very fine powder is in no way necessary. Continuous percolation gave a product slightly stronger than the Official macero-percolation.

Supposing the Tincture to contain ·1 per cent. of alkaloid, it would require about 250 minims of Tincture for $\frac{1}{4}$ grain dose of Conine.

(Belg. and Port., Tinct. Cicutæ, 1 in 5, also Fresh Herb 1. Spirit 1; Fr. and Span., from dried leaves, 1 in 5, Fr., also Alcoolature, fresh Herb 1, Spirit 1, also Ethereal 1 in 5; not in the others.)

### Not Official.

**CONINA.** *Syn.*—CICUTINE. $C_8H_{17}N$, eq. 125. A colourless volatile liquid alkaloid, with a characteristic penetrating odour. It is obtained from *Conium maculatum* by distilling the fruit with dilute Potash or Soda, and purified by redistillation. It unites with acids to form crystalline salts, which are much more stable than the alkaloid.

Sp. g. ·886. It boils at 336° F. (169° C.).

**Solubility.**—1 in 100 of Water. It mixes in all proportions with Alcohol and Ether.

**Dose.**—It has been given in doses of $\frac{1}{12}$ grain to 2 grains, but the foreign Pharmacopœias give much smaller doses, 1 to 4 millegrammes ($\frac{1}{64}$ to $\frac{1}{16}$ grain).

(Belg., Fr., Span. and Swed.; not in the others.)

**CONINÆ HYDROBROMAS.**—A colourless crystalline salt. The usual form for prescribing Conine, of which alkaloid it contains about 60 per cent.

**Solubility.**—1 in 2 of Water; 1 in 3 of Rectified Spirit.

(Russ.; not in the other Pharmacopœias.)

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### Not Official.

## CONVALLARIA.

The entire plant of *Convallaria majalis* (Lily of the Valley).

(Fr. (Muguet), Ital., Span. (Lirio de los Valles), Swiss and U.S.; not in the others.)

**Medicinal Properties.**—It has been long employed by the Russian peasantry as a remedy for dropsy. Professor Sée considers that it may be used in all forms of heart failure, for it has none of the nauseating effects of Digitalis, nor does it exhaust the contractility of the heart and arteries. Dr. Sansom has employed it as a substitute for Digitalis, and is convinced of its action in promoting a stronger ventricular contraction, but is not yet convinced of its superiority to Digitalis (*B.M.J.* '83, i. 148). A cardiac tonic, specially useful in aortic regurgitation, and in mitral stenosis (*L.* '87, ii. 202, 320).

### Preparations.

**EXTRACTUM CONVALLARIÆ.**—(Fr., Ital. and Span.)—Stalks and flowers of Convallaria freshly gathered and dried with one-third quantity of leaves and roots. Cut and infuse twelve hours in six times the weight of Distilled Water. Press, and repeat the operation. Mix the two liquors and evaporate to a soft extract. Dissolve this in sufficient cold Distilled Water. Filter and evaporate over a water-bath to the consistence of a hard extract. Also made from expressed juice, clarified.

The Russians prepare it from the flowers only.

**Dose.**—Professor Sée gave ½ to 1 gramme daily. Dr. Sansom recommends 5 to 8 grs. three times a day. Convallaria contains 2 glucosides—**Convallarin**, a purgative, and **Convallamarin**, allied to Digitalin in its action on the heart; the dose of the latter is ⅛ to 2 grains.

(Swiss and U.S., **Fluid Extract**, with diluted Alcohol, 1 in 1; not in the others.)

**TINCTURA CONVALLARIÆ** (*B.P.C.*).—Lily of the Valley flowers and stalks, dried, in No. 20 powder, 1; Proof Spirit sufficient to percolate 8.

**Dose.**—5 to 20 minims.

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## COPAIBA.

COPAIVA.

The Oleo-Resin obtained by cutting deeply or boring into the trunk of *Copaifera Langsdorffii*, and other species of Copaifera.

Obtained from the northern part of South America. The commercial varieties Para, Maranham, Maracaibo and Angostura, are named from the various ports of shipment. Sp. g. varies from (Para) ·916 to (Maracaibo) ·995 or (Angostura raw) 1·009. Resin (Para) 23·87 to (Maracaibo) 61·43. Sp. g. of Etherial Oil (Para) ·897 to (Bahia) ·908.—*Y.B.P.* '86, 221.

A more or less viscid liquid; generally transparent and not fluorescent, but some varieties are opalescent and occasionally slightly fluorescent, varying in colour from a light yellow to a pale golden brown. Sp. g. ·940—·993.

**Solubility.**—(nearly clear) 1 in 1 (*or less*) of Rectified Spirit, but if more spirit be added it becomes cloudy; in all proportions of Absolute Alcohol, Ether, Benzol, and the fixed and volatile Oils; also in four times (*or less*) its bulk of Petroleum Spirit, the solution only yielding a filmy deposit on standing; also 1 in 2 (*or less*) of Glacial Acetic Acid.

**Test.**—A small quantity heated until all volatile Oil is removed yields a residue which when cold is hard, and, generally, easily rubbed to powder; and the Oil volatilised during the operation does not smell of Turpentine.

Conroy (*P.J.* xvi. 377) states that he has never seen during fourteen years a Balsam which, when completely deprived of Oil, would not powder readily, and thinks the word "generally" should be omitted.

When dissolved in about 20 parts of Carbon Bisulphide and a drop of a cooled mixture of equal parts of Sulphuric and Nitric Acids added, if Gurjun Balsam be present it takes a splendid violet colour, which last several hours.

(Austr., Belg., Dan., Dutch, Fr. (Copahu), Ger., Hung., Ital., Norw., Port. (Terebinthina Copahiba), Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Stimulant and diuretic. Acts upon the mucous membrane, more particularly on that of the genito-urinary organs and of the rectum. Used in gonorrhœa and gleet. Useful in chronic bronchitis when there is excessive mucous secretion.

To be avoided in febrile states of the system and in renal dropsy.

**Dose.**—20 to 60 minims three times a day.

Given floating on Aromatic Water, or sometimes with Spirit of Nitrous Ether. A less disagreeable form is that of **emulsion**, prepared by rubbing the Copaiva first with Mucilage, or the Yolk of an Egg and Sugar, and then with some Aromatic Water. It is also prescribed with Liquor Potassæ, with which it forms a soap.

Both Copaiva and the Oil can be rendered emulsive by trituration with Mucilage. 1½ oz. of Mucilage should be used for every ounce of Copaiva, and either Cinnamon or Peppermint Water, with Tinct. of Orange or Ginger, covers the unpleasant taste. The Balsam and the Oil are also put into **capsules**.

## Preparation.

### OLEUM COPAIBÆ.

The Oil distilled from Copaiva.

The yield appears to be from 41 to 60 per cent.—*Y.B.P.* '91, 414.

Sp. g. about ·890, but varies considerably with the age of the Oil and its exposure to air.

It has a neutral reaction. Boils between 245° and 260° C.

**Solubility.**—1 in 20 of Rectified Spirit; nearly insoluble in Proof Spirit; mixes in all proportions with Absolute Alcohol.

**Dose.**—5 to 20 minims in **emulsion** with Mucilage or Yolk of Egg.

(U.S.; not in the other Pharmacopœias.)

## Not Official.

**MISTURA COPAIBÆ.**—Copaiva, 20 minims; Tincture of Quillaia, 20 minims; Spirit of Nitrous Ether, 30 minims; Camphor Water to 1 oz.—*London Hospital.*

**PASTA COPAIBÆ.**—Copaiva, 8; Powdered Cubebs, 24; Extract of Hyoscyamus, 1; Camphor, 1; Treacle, q.s.

**Dose.**—A piece the size of a filbert nut three or four times a day in gonorrhœa.—*L.* '88, i. 1019.

**PILULA COPAIBÆ.**—Copaïba, 94; Magnesia, 6; mix intimately and set aside to concrete. Should the mixture not concrete in eight or ten hours, the Copaiba before use should be shaken with $\frac{1}{20}$ of its weight of Water, then the uncombined Water allowed to subside and the Copaïba poured off.

(Belg., Balsamum Copaibæ Solidefactum; U.S., Massa Copaiba.)

**RESINA COPAIBÆ.**—Prepared from the Oleo-resin by distilling off the Volatile Oil.

A yellowish or brownish-yellow brittle resin, with an acid reaction.

**Solubility.**—Soluble in Alcohol.

If rubbed well with double its weight of Compound Almond Powder into a paste, will form an **emulsion** with Water.

(U.S.; not in the other Pharmacopœias.)

# CORIANDRI FRUCTUS.

## CORIANDER FRUIT.

The dried ripe fruit of *Coriandrum sativum.*

The ash was determined of the fruits (three samples), 4·69, 5·28, 5·74 per cent., and of Pulvis Coriandri, 5·64, 5·7, 7·79, 7·09 per cent.

(Austr., Belg., Dan., Dutch, Fr., Hung., Norw., Port. (Coentro), Span. (Colantro), Swed. and U.S.; not in Ger., Ital. or Russ.)

**Medicinal Properties.**—Stimulant, aromatic, and carminative.

**Dose.**—20 to 60 grains.

Contained in Confectio Sennæ, Syrupus Rhei, Tinctura Rhei, and Tinctura Sennæ.

### Preparation.

**OLEUM CORIANDRI.**

The Oil distilled in Britain from the fruit.

Consists to the extent of 90 per cent. of **Coriandrol**, $C_{10}H_{18}O$, dextro-rotary; sp. g. ·868; boiling point 194°—198° C.—*P.J.* xxi. 940.

Sp. g. (several examples examined) ·867—·887.

**Solubility.**—2 in 1 of Rectified Spirit; 1 in 75 of Proof Spirit.

1 lb. of fruit yields about 42 grains of Oil.

Used to render medicines more palatable, and prevent griping.

**Dose.**—1 to 4 minims.

(U.S.; not in the other Pharmacopœias.)

Contained in Syrupus Sennæ.

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### Not Official.

## COTO.

A bark from Bolivia—origin unknown.

It contains a bitter principle, **Cotoin**, sparingly soluble in cold Water, soluble in Alcohol.

**Paracotoin** is obtained from an allied bark, which has similar properties.

It is difficult to distinguish true Coto bark from the Para variety, but the glucoside Cotoin melts at 124° C., and gives a blood-red coloration with Nitric Acid, while the melting point of Paracotoin is 152° C. and with Nitric Acid only turns yellow.—*C.D.* '84, 530.

**Medicinal Properties.**—A remedy in chronic diarrhœa.

### Preparation.

**TINCTURA COTO** (*B.P.C.*).—Coto Bark bruised 1; Rectified Spirit 10: macerate seven days, press, filter, and add Rectified Spirit to make 10.

**Dose.**—10 to 30 minims.

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# CREASOTUM.

## CREASOTE.

A strongly refracting liquid, colourless, or very slightly yellow, with a peculiar odour. A product of the distillation of Wood Tar.

The two chief constituents of Creasote are **Guaiacol** and **Creosol**, the first of which predominates in some specimens and the second in others. In Rhenish Creasote Guaiacol predominates, while a sample of Morson's Creasote from "Stockholm Tar," examined by the author, boiled at about 217° C., and consisted chiefly of Creosol.—*Allen.*

It preserves animal substances from decay, from which property its name is derived. It is to the presence of this substance that the process of smoking hams owes its efficacy.

B.P. sp. g. 1·071, but according to Allen the density of Creasote varies between 1·040 and 1·087. Boils about 400° F. (204°·4 C.).

**Solubility.**—About 1 in 400 of Water; in all proportions of Rectified Spirit, Absolute Alcohol, Ether, and Glacial Acetic Acid, but separates on the addition of Water; clear with $\frac{1}{10}$th of its volume of Chloroform, Benzol, or Benzin, milky with more.

**Tests.**—Dropped on white filtering-paper, and exposed to a heat of 212° F. (100° C.), it leaves no translucent stain. An aqueous solution (1 per cent.), with a drop of a dilute neutral solution of Ferric Chloride, yields a green coloration, changing to reddish brown, and, unless the mixture is very dilute, gives a reddish-brown precipitate.

This last test is much more distinct with an alcoholic solution; Creasote will not dissolve 1 in 100 of Water.

The following Official tests are supposed to distinguish between Creasote and Phenols, but they scarcely fulfil this object.

It does not coagulate Albumen. It is miscible with Collodion without production of any precipitate.

Both Creasote and Carbolic Acid coagulate Albumen, and Creasote containing one-third of Carbolic Acid will mix freely with Collodion.

It is not solidified by the cold produced by the mixture of Hydrochloric Acid and Sulphate of Sodium.

Admixture of Phenol with Creosol will prevent freezing.

It turns the plane of polarisation of a ray of polarised light to the right.

We find that pure Guaiacol, pure Creosol, and most commercial samples of genuine Wood Tar Creasote, have no measurable effect whatever upon polarised light. In no case have we observed a rotation greater than + 2° in a 200 mm. tube.

The best differentiating test between Creasote and Phenols is the insolubility of the former in Glycerine. As some samples are more or less soluble in *anhydrous* Glycerine, it is best to dilute 3 measures (sp. g. 1·26) with 1 of Water, and agitate 1 volume of the Creasote sample with 3 volumes of the diluted Glycerine. When separation is complete, a diminution in the Creasote volume indicates roughly the soluble impurity. If the Glycerine layer be run off, the Coal-tar Acids may be extracted from it for examination, by shaking out with Chloroform, after dilution with Water.—*Allen.*

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., Swiss and U.S.; not in Norw. or Swed.)

**Medicinal Properties.**—Astringent, narcotic, styptic, antiseptic, and escharotic. Used in the treatment of tuberculosis. Given internally for chronic gonorrhœa and gleet, for arresting nausea in hysteria and pregnancy, and for obstinate sea-sickness. It has been given with advantage in malignant cholera and cholera infantum, and bleeding from the intestines. It allays thirst and craving for food in diabetes. One drachm in 15 or 20 oz. of Water for a **gargle** in obstinate salivation. 1 drop to 1 oz. of Water is **injected** into the bladder to obviate the putrid odour of the urine. Externally used, in the proportion of 1 drop to 1 drm., for a **lotion**, to eruptions of a scaly character, to burns and chilblains, to erysipelas of the face, with swelling and pain; toothache, when depending on caries, is relieved by its application. The Vapor Creasoti is used as an **inhalation** in bronchitis and in chronic congestion of the larynx.

One drop of Creasote at bedtime every night for juvenile incontinence of urine (*B.M.J.* '87, i. 809). In phthisis 5 minims in **capsules** four times a day *after meals* (*B.M.J.* '88, i. 548). In phthisis 3 drops in 24 hours (*L.* '88, i. 187). In phthisis 8 minims of 3 per cent. **solution** in Almond Oil injected into the lungs (*L.* '88, i. 643). In diabetes 4 drops daily increased to 10 drops (*L.* '89, i. 702).

**Dose.**—1 to 3 minims, dissolved in Water (1 grain to the ounce), or suspended with Mucilage; or in a **pill**, *see* below.

## Preparations.

### MISTURA CREASOTI.

Creasote, 15 minims; Glacial Acetic Acid, 15 minims; Spirit of Juniper, ½ drm.; Syrup, 1 oz.; Distilled Water, 15 oz.: mix the Creasote with the Acetic Acid, gradually add the Water and lastly the Syrup and Spirit of Juniper. =(1 in 516).

It dissolves in the Water without the aid of the Acid.

A good mode of administering Creasote, its unpleasant taste being concealed by the Juniper.

Mucilage will render Creasote emulsive with Water.

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias. *See below* AQUA CREASOTI.)

### UNGUENTUM CREASOTI.

Creasote, 1; Simple Ointment, 8: mix. =(about 1 in 9).

(Not in the other Pharmacopœias.)

Employed in mild cases of ringworm.

### VAPOR CREASOTI.—INHALATION.

Creasote, 12 minims; boiling Water, 8 oz.: mix the Creasote and Water in an apparatus so arranged that air may be made to pass through the solution for inhalation.

Boiling Water is too hot, the best temperature for inhalation is 140° F.

(Not in the other Pharmacopœias.)

## Not Official.

**AQUA CREASOTI.**—U.S. Creasote 1, Water 99; Span. 1 in 173.

**MISTURA CREASOTI C. OPIO.**—Creasote, 1 minim; Tincture of Opium, 2 minims; Spirit of Chloroform, 15 minims; Glycerine, 1 drm.; Water to 1 oz.—*Chest Hospital.*

Creasote, 1 minim; Tincture of Opium, 3 minims; Syrup of Orange, 30 minims; Mucilage, 1 drm.; Cinnamon Water to 1 oz.—*Consumption Hospital.*

**PILULA CREASOTI.**—Creasote, 12 mins.; Curd Soap in powder, 6 grs.; Liquorice in powder, 30 grs.: mix and divide into 12 pills.

**GUAIACOL.**—A colourless liquid, sp. g. about 1·117, soluble in Alcohol, Ether, and fixed Oils; slightly soluble in Water. As it is acted upon by light it should be kept in non-actinic bottles. It is given in Cod Liver Oil, also in weak Spirit.

As this is a very large constituent of Beech Creasote, 60 to 90 per cent., it has been used in the place of Creasote in the treatment of phthisis.

Guaiacol can also be obtained from Guaiacum.

(Ital., Russ. and Swiss; not in the others.)

**Dose.**—It is generally given in flexible **capsules** containing 2 minims, mixed with Almond Oil.

**Guaiacol Carbonate, Guaiacol Salicylate,** and **Benzoyl Guaiacol** (Benzozol), are non-irritating crystalline powders, insoluble in Water. Recommended as improved forms of administering Guaiacol in phthisis, and in typhoid fever.

**Dose.**—5 to 10 grains.

## CRETA.

CHALK.

Native friable Carbonate of Calcium. Used for producing Carbonic Acid Gas.

Chalk cliffs are remarkably absorbent of moisture, and cesspools even, made in the chalk, are always found dry.

In the form of whiting, chalk can be obtained in almost every house; when mixed with Water to the consistence of cream, it is an excellent application for burns.

(Austr. and Span.; not in the others.)

## CRETA PRÆPARATA.

PREPARED CHALK.

Carbonate of Calcium, $CaCO_3$, nearly pure, eq. 100.

Chalk freed from most of its impurities by elutriation, and afterwards dried in small cones.

**Insoluble** in Water.

**Tests.**—Almost entirely soluble in Diluted Hydrochloric Acid with effervescence. This solution, when supersaturated with Solution of Ammonia, gives a copious white precipitate on the addition of Oxalate of Ammonium. The salt formed by dissolving the Prepared Chalk in Hydrochloric Acid, if rendered neutral by evaporation to dryness and then redissolved in Water, gives only a very scanty precipitate on the addition of Saccharated Solution of Lime (absence, or only a trace, of Alumina, Magnesia, Ferric Oxide, or Phosphates).

(Austr., Belg., Fr., Hung., Ital., Norw., Port., Russ., Span., Swed. and U.S.; not in the others.)

**Medicinal Properties.**—It is astringent and antacid. Combined with other astringents and aromatics, it is used in diarrhœa accompanied with acidity. One of the best antidotes for Oxalic Acid. Has been recommended in rachitis and in scrofulous affections. Used externally to burns and ulcers.

Prescribed in powder or suspended in Mucilage.

**Dose.**—10 to 60 grains.

Contained in Hydrargyrum cum Cretâ.

**Incompatibles.**—All Acids and Sulphates.

### Preparations.

**MISTURA CRETÆ.**

Prepared Chalk, 1; Gum Acacia, in powder, 1; Syrup, 2; Cinnamon Water, 30: mix by trituration. =(1 in 34).

**Dose.**—1 to 2 oz. with astringent tinctures and Opium.

(Port., Carbonate of Lime 3, Gum Arabic 3, Syrup of Cinnamon 10, Water 84; U.S., Prepared Chalk 6, Acacia 4, Sugar 10, Cinnamon Water 40, Water to measure 100; not in the others.)

**PULVIS CRETÆ AROMATICUS.** *B.P.Syn.*—CONFECTIO AROMATICA.

Prepared Chalk, 11; Cinnamon, 4; Nutmeg, 3; Saffron, 3; Cloves, 1½; Cardamom Seeds, 1; Refined Sugar, 25; all in powder: mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

If a product of a bright colour be desired, the Saffron may previously be moistened and triturated with a little Water or Spirit, or the fresh and faintly damp mixture may be subjected to considerable pressure in the triturating process.

**Dose.**—10 to 60 grains. =(about 1 Chalk in 4½).

**PULVIS CRETÆ AROMATICUS CUM OPIO.**

Aromatic Powder of Chalk, 39; Opium, in powder, 1: mix thoroughly and pass through a sieve. =(1 Opium in 40).

**Dose.**—10 to 40 grains.

### Not Official.

**CHOLERA MIXTURE.**—Aromatic Powder ('64), 3 drms.; Sp. Sal Volatile, 3 drms.; Tincture of Catechu, 10 drms.; Compound Tincture of Cardamoms, 6 drms.; Tincture of Opium, 1 drm.; Chalk Mixture to make 20 oz.

This mixture was proposed by the Board of Health during the prevalence of cholera, and is useful in all cases of diarrhœa.

**Dose.**—1 oz. for an adult, ½ oz. for a child twelve years old, ¼ oz. for seven years old, after each liquid motion.

**UNGUENTUM CRETÆ.**—Prepared Chalk, 1; Spermaceti Ointment, 4: mix.

## CROCUS.

### SAFFRON.

The dried stigmas and top of the style of *Crocus sativus.*

Imported from Spain, France, and Italy.

**Tests.**—When rubbed on the moistened finger it tinges it an intense orange-yellow. Pressed between folds of white filtering-paper it leaves no oily stain. When placed in warm Water it colours the liquid orange-yellow, but should not deposit any white or coloured powder. It yields on ignition about 6 per cent. of ash.

Concentrated Sulphuric Acid instantly changes its colour to indigo-blue, which soon disappears.

1 part of Saffron shaken with 100,000 parts of Water gives it a distinct yellow colour. Should lose not more than 14 per cent. when dried at 100° C. The dried Saffron should yield not more than 7·5 per cent. of ash. Ger. Ph.

A Paper on Detection of Adulterants.—*P.J.* xxi. 612.

(In all the Pharmacopœias; Fr., Safran; Ital., Zafferano.)

**Medicinal Properties.**—A slightly exhilarating stimulant. Useful for giving colour and flavour to Official preparations.

Contained in Decoctum Aloes Comp., Pil. Aloes et Myrrhæ, Pulvis Cretæ Aromaticus, Tinct. Cinch. Comp., Tinct. Rhei, and Tinct. Opii Ammoniata.

### Preparation.

**TINCTURA CROCI.**

Saffron, 1; Proof Spirit, 20: macerate forty-eight hours with 15 of the Spirit, agitating occasionally, pack in a percolator, let it drain, and then pour on the remaining Spirit; when it ceases to drop, press and add Proof Spirit to make 20. =(1 in 20).

**Dose.**—½ to 2 drms.

It is pointed out (*Y.B.P.* '90, 474) that a mixture of Rectified Spirit 3, Water 1, is the best menstruum for extracting colouring matter from Saffron, but that this "yields a tincture having from 40 to 50 times the colouring power of the B.P. tincture" we think must be a mistake. If there is any difference, it is in favour of B.P.

(Belg. and Span., 1 in 5; Dutch, Fr., Russ., Swiss and U.S., 1 in 10; all by weight except U.S.; not in the others.)

### Not Official.

**GLYCERINUM CROCI.**—Saffron 1; Glycerine 20; Proof Spirit 20: mix the Glycerine and the Spirit, and digest in it the Saffron for an hour at a gentle heat, and filter.

This is introduced as a substitute for **Syrupus Croci**, which deposits and loses its colour.

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## CROTONIS OLEUM.

### CROTON OIL.

*N.O.Syn.*—OLEUM TIGLII.

The Oil expressed in Britain from the seeds of *Croton tiglium*.

A native of Hindostan, Ceylon, and the Moluccas.

100 parts of seed yield about 50 of Oil.

A brownish yellow liquid. Sp. gr. ·940—·950.

**Solubility.**—Soluble in Ether, Oil of Turpentine, and Olive Oil; partially soluble in Rectified Spirit.

B.P. states that it is "entirely soluble in Alcohol," but this is true only of occasional samples.

The solubility of Croton Oil in Absolute Alcohol appears to depend in a great measure on the age of the Oil, and the greater or less freshness of the seeds from which it was expressed, as oxidised or resinified Oil dissolves the more readily.—*P.J.* '65, i. 382; viii. 705; and xviii. 546.

The explanation of the above appears to be that the solubility of the Oil as a whole depends upon the proportion of free Acid, which is very soluble in Alcohol, and also carries the difficultly soluble neutral Glyceride into solution along with it. —*P.J.* xx. 1060.

Croton Oil can be separated by Alcohol into two parts. The non-vesicating portion insoluble in Alcohol possesses the full purgative properties of the Oil in a less irritating form; the alcohol-soluble or vesicating portion had no purgative action in the same doses, but caused irritation and nausea.—*P.J.* xiv. 446.

Croton Oil dissolves Absolute Alcohol up to equal parts, but if more Alcohol be added a separation takes place.

DETECTION OF CROTON OIL IN MIXTURES.—Shake the mixture with Alcoholic Potash; separate the alcoholic layer, add dilute acid, and distil off the spirit. Shake the residue with Ether, which separate, and evaporate; the oil thus obtained should produce the characteristic pustular eruption when applied to the skin.—*P.J.* xviii. 547.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span. (Aceite de Grano Tiglii), Swed., Swiss and U.S.)

**Medicinal Properties.**—A powerful hydragogue purgative, acting with great rapidity. Given in cases of obstinate constipation, and in apoplexy. Useful in dropsy following scarlet fever, in doses of $\frac{1}{8}$ to $\frac{1}{4}$ of a drop, rubbed up with mucilage, syrup, and water. Applied externally as a counter-irritant in rheumatism, gout, neuralgia, glandular and other indolent swellings, and in laryngeal and pulmonary diseases in the form of **liniment.**

5 minims to 1 oz. of Olive Oil are used to promote the growth of hair.

*Is an hepatic stimulant of very feeble power.—Dr. Rutherford.*

**Dose.**—$\frac{1}{3}$ to 1 minim. In pill with Soap and Liquorice Powder (p. 405), or in combination with Comp. Ext. of Colocynth.

**Antidotes.**—In case of an overdose which acts as a violent purgative, an emetic of 20 grains of Sulphate of Zinc should be at once administered, followed by mucilaginous fluids and Opium to check the diarrhœa.

### Preparation.

**LINIMENTUM CROTONIS.**

Croton Oil, 1; Oil of Cajuput, 3½; Rectified Spirit, 3½: mix. =(1 in 8).

(Not in the other Pharmacopœias.)

### Not Official.

**CROTON OIL PENCILS.**—Croton Oil 2, Cacao Butter 1, White Wax 1: melt together the last two in a water-bath, add the Oil, and when nearly cold pour into moulds.

## CUBEBA.

CUBEBS.

The dried unripe full-grown fruit of *Piper cubeba.*

**Test.**—A decoction when cold is coloured bright indigo-blue by Solution of Iodine.

Concentrated Sulphuric Acid applied to crushed Cubebs produces a deep crimson colour with a distinct carmine tint.—*P.J.* xv. 909.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Gently stimulant, with special direction to the urinary organs. Given in gonorrhœa, most safely when the inflammation is confined to the mucous membrane of the urethra. Frequently combined with Copaiba. The Essential Oil in Syrup is expectorant, useful in croup, and in diphtheritic sore throat.

The Tincture is given with an equal quantity of Tincture of Orange to cover the taste.

**B.P.Dose.**—30 to 120 grains.

It is given in the above doses, wrapped in moistened wafer-paper, three or four times a day for gonorrhœa. In other cases the dose may be reduced to 10 grains.

Lozenges are made, and called bronchial troches.

## Preparations.

**OLEO-RESINA CUBEBÆ.** *N.O.Syn.*—Extractum Cubebarum.

Percolate Cubebs in course powder with Ether, slowly, until the liquor passes colourless. Let the Ether evaporate from the liquor, at first spontaneously and then over a water-bath, or recover it by distillation; and transfer the residue to a closed vessel, letting it stand until waxy or crystalline matter ceases to be deposited. Decant the Oleo-Resin and preserve it in a well-stoppered bottle.

**Dose.**—5 to 30 minims.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Russ., Swiss and U.S.; not in the others.)

**OLEUM CUBEBÆ.**

The Oil, distilled in Britain. Colourless, or greenish-yellow.

The yield is about 10 per cent.

Sp. g. (several samples taken) ·907 to ·930.

**Solubility.**—1 in 18 of Rectified Spirit, in all proportions of Absolute Alcohol.

**Dose.**—5 to 20 minims, suspended in Water by means of Mucilage and Sugar.

(Port., sp. g. ·929; Span. and U.S., sp. g. about ·920; not in the others.)

**TINCTURA CUBEBÆ.**

Cubebs, in powder, 1; Rectified Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator, and let it drain; pour on the remaining Spirit, and when it ceases to drop, press and add Rectified Spirit to make 8. =(1 in 8).

**B.P.Dose.**—$\frac{1}{2}$ to 2 drachms.

There is a great discrepancy between the Official doses of this and the powdered fruits. The quantities are the same, though the Tincture is 1 in 8.

(Fr., 1 in 5, by weight; U.S., 1 in 5; not in the other Pharmacopœias.)

## Not Official.

**EXTRACTUM CUBEBÆ FLUIDUM** (*U.S.*).—Cubebs in No. 60 Powder, 100 grammes, percolated with Alcohol (94 p. c. by vol.) until the Cubebs are exhausted, reserve the first 90 c. c. of percolate, and evaporate the remainder to a soft extract, dissolve this in the reserved portion and add sufficient Alcohol to make 100 c. c.

**Dose.**—5 to 30 minims.

# CUPRUM.

COPPER.

Cu, eq. 63·5.

Copper wire about No. 25 gauge, or about ·02 inch, is used for preparing Spiritus Ætheris Nitrosi.

Sp. g. 8·9: fuses about 2000° F.

Copper, or Venus of the Alchemists, has been employed from the earliest ages, and previous to the discovery of malleable iron was the principal ingredient in the formation of domestic utensils and instruments of war. It takes its name from the island of Cyprus, where it was wrought by the Greeks. The purest Copper is that which is deposited by electricity.

The distinctive qualitative tests for Copper in solution are: 1. Black precipitate with Sulphuretted Hydrogen, in acid solution; 2. Blue precipitate with Ammonia easily soluble in excess to deep blue liquid, decolorised by Cyanide of Potassium; 3. Chocolate-brown precipitate with Ferrocyanide of Potassium insoluble in Acetic Acid; 4. Metallic deposit on bright Iron.

(Span.; not in the other Pharmacopœias.)

## CUPRI NITRAS.

### NITRATE OF COPPER.

$Cu(NO_3)_2, 3H_2O$, eq. 241·5.

Deep blue prismatic crystals, very deliquescent; prepared by dissolving Copper in Diluted Nitric Acid and evaporating the solution until crystallisation takes place on cooling to a temperature not lower than 70° F. (21°·1 C.).

With one-third of its weight of Water, it forms at a temperature below 70° F. (21°·1 C.) tabular crystals, $Cu(NO_3)_2, 6H_2O$. With a very little more Water, added directly or absorbed from the air, it yields a styptic, caustic, corrosive fluid.

**Solubility.**—2 in 1 of Water; 2 in 1 of Rectified Spirit.

**Tests.**—The diluted aqueous solution is only faintly acid to Litmus; gives a maroon-red precipitate with Ferrocyanide of Potassium; affords a violet-blue solution with excess of Ammonia; and on the addition of 2 or 3 crystals of Sulphate of Iron and a few drops of Sulphuric Acid yields a black zone round the crystals.

(Not in the other Pharmacopœias.)

Not Official.

## CUPRI SUBACETAS.

*Syn.*—ÆRUGO. VERDIGRIS.

Pale green powder or masses, partly crystalline.

When treated with Water about 50 per cent. dissolves as Acetate of Copper, leaving an insoluble basic Acetate.

(Belg., Dan., Fr., Port. and Span. (Cardenillo); not in the others.)

**Medicinal Properties.**—Used as a stimulant to foul and indolent ulcers, also as an escharotic.

### Preparation.

**LINIMENTUM ÆRUGINIS** (*P.L.*).—Made by dissolving Verdigris, 1, in Vinegar, 7, adding Honey, 14, and boiling down to a proper consistence.

This preparation, with different proportions, also occurs in Belg., Fr., Ital., Port., Span. and Swiss. Most of them direct that the preparation shall be boiled until it assumes a red colour, which indicates that the Cupric Acetate has been reduced to a Cuprous compound.

**CUPRI ACETAS.**—Deep green, prismatic crystals.

**Solubility.**—1 in 15 of Water, 1 in 300 of Rectified Spirit, 1 in 112 of Glycerine.
(Ital., Swed. and Swiss; not in the others.)

**Medicinal Properties.**—Similar to the Subacetate, but more definite when required for solution in Water.

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## CUPRI SULPHAS.

SULPHATE OF COPPER.

$CuSO_4.5H_2O$, eq. 249·5.

*N.O.Syn.*—Blue Vitriol. Bluestone.

In oblique prismatic crystals of a clear blue colour.

When rendered anhydrous by heating, the powder is white.

**Solubility.**—1 in 3 of Water, 2 in 1 of Water (at 212° F.); insoluble in Rectified Spirit; 1 in 2½ of Glycerine.

**Tests.**—An aqueous solution of the salt strongly reddens Litmus; if twice its volume of Solution of Chlorine is added, and then treated with an excess of Solution of Ammonia, it gives a violet-blue solution, leaving nothing undissolved—indicating absence of Iron and other impurities. The aqueous solution gives with Chloride of Barium a white precipitate insoluble in Hydrochloric Acid (Sulphate of Barium), and a maroon-red precipitate with Ferrocyanide of Potassium (Ferrocyanide of Copper).

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Solfato di Rame), Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Astringent, tonic, and emetic. Given in epilepsy and chorea. Recommended also in croup and in chronic diarrhœa. Externally, as a styptic for bleeding surfaces and a stimulant to ulcers, as an escharotic for warts, &c. For **lotions**, in proportions from 2 to 4 grs. to 1 oz.; also 8 grs. to 1 oz. for prurigo genitalium. As an **injection**, to diminish excessive secretion from mucous membranes, especially in cases of prolapsus ani, where it affords permanent relief, the solution should be made 5 grs. to the oz. For urethral **injections,** 1 to 4 grs. in an ounce of Water. It is also used in various affections of the eyes when astringent applications are required. Also in some skin affections.

Sulphate of Copper 10 grs., Tincture of Opium 60 mins., Water 4 oz. This was used as a rectal injection in a bad case of dysentery.—*L.* '89, ii. 739.

**B.P.Dose.**—As an astringent, ¼ to 2 grs., as an emetic 5 to 10 grs.

¼ gr. gradually increased to 2 grs. three times a day, in **pill,** as a tonic for epilepsy; 10 grs. in 2 oz. of Water as a prompt emetic in cases of narcotic poisoning.

**Incompatibles.**—Alkalies and their Carbonates, Lime Water, Iodides, and most astringent Vegetables.

**Antidotes.**—In case of poisoning by Sulphate of Copper, Albumen or White of Egg is the best antidote, followed by Laudanum internally, and Linseed Meal poultices applied to the abdomen.

## SOLUTION OF POTASSIO-CUPRIC TARTRATE.

No. 1. Sulphate of Copper, 346·4 grs.; Distilled Water, a sufficiency: dissolve the Sulphate of Copper in a portion of the Water, and dilute the Solution with more of the Water to the volume of 5000 grain-measures.

No. 2. Caustic Soda, 1¾ oz.; Tartarated Soda, 4 oz.; Distilled Water, a sufficiency: dissolve the Caustic Soda and Tartarated Soda in a portion of the Water, and dilute the Solution with more of the Water to 5000 grain-measures.

When required for use, mix equal volumes of the Solutions No. 1 and No. 2.

This test-solution has been inserted in the *Appendix* of the "Additions," '90, but for convenience it is inserted here.

As stated in our letter to the *Pharmaceutical Journal*, January 10, '91, p. 616, it is to be regretted that when introducing a test solution for Sugar into the Pharmacopœia, Pavy's Solution was not preferred to Fehling's.

Fehling's Solution is only employed Officially for the testing of Picrotoxin, for which Pavy's Solution is equally applicable; but as the latter is much better suited for the estimation of Sugar in urine, a purpose to which it is largely applied by the medical profession and chemists, it seems a matter of surprise that this escaped the notice of the Pharmacopœia Committee.

The following criticism (!) appears on the above in *P.J.* xxi. 643:—"The claims of Pavy's Solution have been particularly pressed, because it is preferable as a test for Sugar in urine; but as that fluid is not likely to be introduced as a remedy into the Pharmacopœia, the force of the criticism is not obvious."

The proportions of Copper Sulphate and Rochelle Salt are the same as given in the "Companion," '90, but the Caustic Soda has been increased 50 per cent., the general impression being that increased alkalinity renders the Solution more permanent. It should be noted that Fehling's Solution cannot be diluted to an unlimited extent without precipitation on boiling; and as this limit depends upon the alkalinity of the Solution, that now Official will bear more dilution than one weaker in Alkali, but it is not advisable to dilute this with more than eight times its volume of any fluid to be tested. It must also be borne in mind that the amount of Copper reduction with a given quantity of Sugar will vary considerably with the degree of dilution, and also with ratio of Copper to Sugar, &c.

The addition of $\frac{1}{10}$ per cent. of Sulphuric Acid to the Copper Solution (recommended by Sutton), which prevents any precipitation of basic salt, has not been recognised in the "Additions" formula.

### Not Official.

**GUTTÆ CUPRI SULPHATIS** (*L.O.H.*).—Sulphate of Copper, 2 grs.; Water to 1 oz.—The strength in use at the principal Hospitals.

**CUPRI OLEAS.**—Dissolve 180 grs. of Sulphate of Copper in 20 oz. of Distilled Water, then add 20 oz. of Solution of Oleate of Sodium; heat till the precipitate melts and agglomerates, wash once or twice with boiling Water, collect and dry. When prepared from concentrated solutions it is much more difficult to free from Soap and adhering salts.

When prepared from Castile Soap, it is very soft and sticky at 130° F. and melts to a clear blue liquid at 160° F., but when prepared from a pure Oleic Acid Soap, it softens and melts about 20 degrees lower.

Has also been made by heating Oleic Acid with excess of freshly precipitated

Copper Carbonate, freeing from Water, dissolving in Benzene, and evaporation. Made in this way it is a hard, brittle solid, melting at 167° C.—*P.J.* xxii. 1009.

**Medicinal Properties.**—It is an excellent antiseptic and antiparasitic agent. When diluted it is especially useful in ringworm.

**UNGUENTUM CUPRI OLEATIS.**—Oleate of Copper, 1; Lard, 4: melt together, and stir till cold.

Useful in ringworm, hard and horny warts, corns, and bunions.—*B.M.J.* '84, ii. 752.

**LAPIS DIVINUS. CUPRUM ALUMINATUM.**—Sulphate of Copper, Nitrate of Potassium, and Alum, of each equal parts, in powder, fused in a glazed earthen crucible, powdered Camphor, to the extent of $\frac{1}{50}$th part of the whole, being added near the end of the process. When cold, break in pieces and keep in a closely stoppered bottle. An **eye-wash** may be made of 2 grains to an ounce of distilled Water.

(Belg., Dan., Dutch, Fr. (Pierre Divine), Ger., Hung., Russ., Span., Swed. and Swiss; not in the others.)

**FEHLING'S SOLUTION** (*Sutton*).—**Copper Solution.**—Crystallised Sulphate of Copper, 69·28 grammes; Sulphuric Acid, 1 c.c.; Water to 1,000 c.c.

**Alkaline Tartrate Solution.**—Rochelle Salt, 350 grammes; Caustic Soda, 100 grammes; Water to 1,000 c.c.

When these Solutions are mixed in equal volumes, 1 c.c. is taken to be equal to ·005 grammes of Glucose.

**PAVY'S SOLUTION.**—Crystallised Sulphate of Copper, 34·65 grammes; Rochelle Salt, 170 grammes; Caustic Potash, 170 grammes; Water to 1,000 c.c.

When 120 c.c. of this Solution are mixed with 400 c.c. of Ammonia (sp. g. ·880) and diluted to 1,000 c.c., then 10 c.c. may be taken as equivalent to ·005 grammes of Glucose.

The method is well adapted for the examination of Diabetic Urine and Milk, also mixtures of Milk and Cane Sugars, and certainly has the advantage over the ordinary Fehling method by its definite end reaction.—*Sutton.*

Not Official.

## CURARE—WOORARA.

A powerful poison obtained from various species of Strychnos, and used by the Indians in the Northern part of South America for arming the points of their arrows. A brownish black shining brittle resinous mass almost wholly soluble in Water, sparingly soluble in Absolute Alcohol. Different samples vary very much in strength, so that the dose of every parcel has to be arrived at by experiment. It is only used **hypodermically**, and the **solution** 1 grain in 12 minims given in former editions of the "Companion" is now included in B.P.C. An Alkaloid **Curarina** has been obtained from Curara.

(Fr. and Span.; not in the other Pharmacopœias.)

**Medicinal Properties.**—It has been used in the treatment of hydrophobia, tetanus, and chorea.

It is not poisonous when swallowed, but is strongly toxic when injected under the skin.—*Ringer*, p. 445.

**Dose.**—$\frac{1}{12}$th to $\frac{1}{2}$ grain, but should be used with great care.

### Preparation.

**INJECTIO CURARE HYPODERMICA** (*B.P.C.*).—Curare 5 grains; powder and make it into a paste with Distilled Water; transfer to a funnel plugged with absorbent wool, and gradually pour upon it Distilled Water until one fluid drachm is obtained. If the injection be required in haste, rub the Curare with 60 minims of Distilled Water, throw on a filter, and when it ceases to drop, pour over the contents of the filter sufficient Distilled Water to produce one fluid drachm.

**Dose.**—1 to 6 minims.

## CUSPARIÆ CORTEX.

### CUSPARIA BARK.

*N.O.Syn.*—ANGUSTURA BARK.

The dried bark of *Galipea cusparia*, from tropical South America.

Two alkaloids, **Cusparine** and **Galipeine**, have been extracted from Cusparia Bark. The Sulphate and Hydrochlorate of Cusparine are slightly soluble in Water, the Acetate and Tartrate much more so.—*P.J.* xiv. 423.

**Test.**—The inner surface touched with Nitric Acid does not become an arterial blood-red colour.

NOTE.—Strychnos Bark, for which this test was introduced, contains Brucia, which becomes blood-red by contact with Nitric Acid; but this bark is now so scarce that it is difficult to obtain even a specimen of it.

(Belg., Fr., Port. and Span., Angustura; not in the others.)

**Medicinal Properties.**—An aromatic tonic. Used in intermittent fever, dysentery, and in convalescence from acute diseases. Aromatics are generally combined with it, to prevent nausea.

### Preparation.

**INFUSUM CUSPARIÆ.**

Cusparia Bark, in No. 40 powder, 1; Distilled Water at 120° F. (48°·9 C.), 20: infuse one hour and strain. =(1 in 20).

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias.)

**Incompatibles.**—Mineral Acids, Perchloride of Iron, and other Metallic Salts.

## CUSSO.

### KOUSSO.

The dried panicles (chiefly of the female flowers) of *Hagenia abyssinica*.

Obtained from Abyssinia.

(Austr., Dutch, Ger. and Russ., Koso; Belg., Fr. and Port., Cousso; Ital., Kousso; Dan., Hung., Norw. and Swed., Kusso; Span., Couso; Swiss, Kosso; U.S., Cusso.)

**Medicinal Properties.**—Anthelmintic. Especially useful for tænia.

**Dose.**—$\frac{1}{4}$ to $\frac{1}{2}$ oz.

### Preparation.

**INFUSUM CUSSO.**

Kousso, in coarse powder, 1; boiling Distilled Water, 16: infuse fifteen minutes, without straining. =(1 in 16).

**Dose.**—4 to 8 oz.

(Fr. (Apozème de Cousso) about 1 in 8; Span. (Inf. de Couso), 1 in 11½; not in the other Pharmacopœias.)

### Not Official.

## CYDONIUM.

### QUINCE SEED.

The seeds of *Cydonia vulgaris.*

Their coriaceous envelope abounds in mucilage.

(Austr., Belg., Dutch, Fr. (Coing), Norw., Port. (Marmelo), Russ., Span. (Membrillo), Swed. and Swiss; not in Dan., Ger., Hung., Ital. or U.S.)

**Medicinal Properties.**—Demulcent. The **decoction** is used externally for cracks in the skin. A nice adjunct to eye-lotions in cases of irritation and inflammation.

### Preparations.

**DECOCTUM CYDONII.**—Quince Seed, 1; Distilled Water, 80: boil for ten minutes, and strain.

**MUCILAGO CYDONII,** by cold maceration.—Austr., 1 in 25; Belg. and Port., 1 in 100; Norw., Russ., Swed. and Swiss, 1 in 50; Fr., 1 in 10; Span., 1 in 46.

### Not Official.

## DAMIANA.

The leaves of a species of *Turnera,* from Mexico and California.

Contains a bitter substance, resins, and a volatile oil.

**Medicinal Properties.**—Tonic, diuretic, and aphrodisiac.

### Preparations.

**EXTRACTUM DAMIANÆ LIQUIDUM.**—Damiana leaves exhausted with Proof Spirit so that 1 of fluid will represent 1 of the drug.

**Dose.**—30 to 60 minims.

**EXTRACTUM DAMIANÆ.**—The above evaporated to a soft extract.

**Dose.**—5 to 10 grains.

## DECOCTA.

### DECOCTIONS.

The following are the Decoctions of the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared:—

| | Proportion of active ingredients to the whole. | Dose. |
|---|---|---|
| DECOCTUM ALOES COMPOSITUM . . | 1 in 100. | ½ to 2 oz. |
| DECOCTUM CETRARIÆ . . . . . . . . | 1 in 20. | 1 to 4 „ |
| DECOCTUM CINCHONÆ . . . . . . . . | 1 in 16. | 1 to 2 „ |
| DECOCTUM GRANATI RADICIS . . . | 1 in 10. | 2 to 4 „ |

| | Proportion of active ingredients to the whole. | Dose. |
|---|---|---|
| DECOCTUM HÆMATOXYLI | 1 in 20. | 1 to 2 oz. |
| DECOCTUM HORDEI | 1 in 10. | 1 to 4 „ |
| DECOCTUM PAPAVERIS | 1 in 10. | |
| DECOCTUM PAREIRÆ | 1 in 16. | 1 to 2 „ |
| DECOCTUM QUERCÛS | 1 in 16. | 1 to 2 „ |
| DECOCTUM SARSÆ | 1 in 8. | 2 to 10 „ |
| DECOCTUM SARSÆ COMPOSITUM | 1 in 8. | 2 to 10 „ |
| DECOCTUM SCOPARII | 1 in 20. | 2 to 4 „ |
| DECOCTUM TARAXACI | 1 in 20. | 2 to 4 „ |

Decoctions not Official are enumerated in the Index.

U.S. gives a general formula for Decoctions: pour 20 of cold Water upon 1 of the substance, cover it well, and boil for fifteen minutes. Then let it cool to about 104° F. (40° C.), express, strain the expressed liquid, and pour through the strainer enough cold Water to make the product measure 20.

Ger.: pour cold Water upon the substances in a suitable vessel and expose for half an hour with occasional agitation to the steam from boiling Water on a water-bath, and strain while still warm with expression; 10 of strained product should be obtained from 1 of substance.

U.S. and Ger. state that in Decoctions of energetic substances the strength should be specially prescribed by the physician.

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## DIGITALIS FOLIA.

### FOXGLOVE LEAVES.

The leaves of *Digitalis purpurea* (Foxglove), gathered from wild British plants of the second year's growth, when about two-thirds of the flowers are expanded, carefully dried.

Taste very bitter and unpleasant.

The more or less definite principles contained in Digitalis may be arranged as follows under the names applied to them by Schmiedeberg, and the important references connected with the subject are *P.J.* v. 741; xvii. 163, 871; xx. 503; xxii. 694:—

(*a*) **Digitonin.**—A crystallisable body resembling Saponin, constituting the larger part of the glucosidal constituents. Soluble in Water, insoluble in cold Alcohol, Ether, Benzol, or Chloroform. It has none of the physiological action peculiar to Digitalis and in other respects is directly injurious.

(*b*) **Digitalein.**—An amorphous glucoside (possibly a mixture). Soluble in Water and in Alcohol, insoluble in Ether or Chloroform. Its action on the heart is non-cumulative and causes no irritation when subcutaneously injected.

(*c*) **Digitalin.**—A granular (if not crystalline) glucoside, soluble in Alcohol, almost insoluble in Water, sparingly soluble in Ether or Chloroform.

Possesses in a high degree the medicinal action of Digitalis.

(*d*) **Digitoxin.**—Crystalline. Easily soluble in Alcohol, slowly in Chloroform, very sparingly in Ether, quite insoluble in Water.

The most toxic of all the constituents, but uncertain, cumulative and dangerous in its action.

(*e*) **Digitin.**—A crystalline body, physiologically inert, difficultly soluble in Water, more readily in Alcohol, insoluble in Ether or Chloroform.

The commercial varieties are given under Digitalin, p. 228.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port. (Dedaleira), Russ., Span. (Digital), Swed., Swiss and U.S.)

**Medicinal Properties.**—Cardiac tonic, specially useful in mitral disease. Sedative and diuretic, useful in acute dropsy with cardiac weakness. Has been recommended in prostration from fever; in delirium tremens; in spermatorrhœa; also for the relief of hæmorrhage. It is cumulative in action, and requires caution.

**Dose.**—½ to 1½ grains of the powdered leaf.

**Incompatibles.**—Sulphate of Iron, Tincture of Perchloride of Iron, preparations of Cinchona, Acetate of Lead.

**Antidotes.**—In case of an overdose, a recumbent posture is of paramount importance; and after the stomach has been emptied, 20 grains of Tannic or Gallic Acid in hot Water given frequently, or hot strong tea or coffee; stimulants externally and internally should be employed.

## Preparations.

### INFUSUM DIGITALIS.

Foxglove leaves, dried, 28 grs.; boiling Distilled Water, 10 oz.; infuse fifteen minutes and strain. =(1 in 156).

It seems generally admitted in France that a *cold* infusion is the best of the preparations of Digitalis. 25 to 40 centigrammes of coarsely powdered leaves are macerated in 300 grammes of cold Water for twelve hours and filtered. This quantity is taken in 2 or 3 doses, as a powerful diuretic.—*L.* '90, i. 1153.

**Dose.**—¼ to ½ oz.

(Dutch and Port., 1 in 200; Span., 1 in 345; Swed., 1 in 100; U.S., with Cinnamon, 3 in 200; not in the others.)

### TINCTURA DIGITALIS.

Foxglove leaves, in No. 20 powder, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of Spirit, agitating occasionally, pack in a percolator, and let it drain, then pour on the remaining Spirit; afterwards subject the contents of the percolator to pressure, filter the product, mix the liquids, and add sufficient Proof Spirit to make 8. =(1 in 8).

**Dose.**—10 to 30 minims; but in cases of delirium tremens, 1 drm. every three hours. Two or even three drms. have been given in cases carefully watched.—*Pr.* xxvii. 373.

(Austr., Dan., Dutch, Ital., Norw., Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Port. and Span., 1 in 5; U.S., 15 in 100. Also Belg., Fr., Port. and Span., 1 **fresh leaves**, 1 Spirit; Ger., **fresh leaves** 5, Spirit 6; Fr., with Ether, 1 dried leaves in 5; Dan. and Port., with Spirit of Ether, 1 dried leaves in 10: all by weight except U.S.)

## Not Official.

**PILULA DIGITALIS COMP.**—Digitalis Powder ½ gr.; Squill, 1 gr.; Blue Pill, 3 grs.: in one pill.—*St. George's.*

**SUCCUS DIGITALIS.**—The Expressed Juice, 3; Rectified Spirit, 1.

This preparation may be given for a longer period than the Tincture without causing nausea.

**Dose.**—5 to 10 minims.

**DIGITALIN.**—Under this name four distinct varieties occur in commerce, which differ so considerably in their medicinal properties that prescribers should be careful to distinguish and specify the kind intended. All four of them are soluble in Alcohol.

1. **Digitalin Amorphous** (**Homolle**).—Stated to consist mainly of Digitalin with some Digitoxin.
   Soluble in Chloroform, slightly soluble in Water.
   (Official in Belg., Fr., Port., Russ. and Span.; formerly in Brit.)
2. **Digitalin Crystallised** (**Nativelle**).—Stated to consist almost entirely of Digitoxin.
   Soluble in Chloroform, insoluble in Water.
   (Official in Fr. and Span.)
3. **Digitalin German.**—Amorphous; consists principally of Digitalein with some Digitonin and Digitalin.
   Readily soluble in Water, almost insoluble in Chloroform.
4. **Digitalin Verum.**—Kiliani (*P.J.* xxii. 1061) states, with some show of reason, that the Digitalin of Schmiedeberg is the best form in which to prescribe Digitalis, and to distinguish it he applies the name Digitalin Verum. Its composition is definite; it is obtainable commercially in a sufficiently pure condition; it possesses all the medicinal activity in regard to the action of Digitalis upon the heart; it is non-cumulative in its action; the dose is $\frac{1}{4}$ mgrm. ($\frac{1}{270}$ gr.) every 2 or 3 hours; it is soluble about 1 in 1000 of Water, about 1 in 100 of (50 per cent.) Alcohol. The aqueous solution froths upon being shaken, and is remarkably prone to become mouldy.

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Not Official.

## DUBOISIA MYOPOROIDES.

A plant indigenous in N.S. Wales and Queensland; it has been classed in the order *Solanaceæ.*

(Span.; not in the other Pharmacopœias )

Dr. Ringer's experiments show that the physiological action of the extract is apparently identical with Atropine. Mr. Tweedy has used it as an application to the eye in all cases in which Atropine was indicated.

Ladenburg examined a sample of Sulphate of Duboisine received from Merck, and found the alkaloid to be identical with Hyoscyamine, the Gold-salt melting at 159° C.—*P.J.* '80, x. 790.

Ladenburg some years later examined another sample from the same maker, and found it to be identical with Hyoscine, the Gold-salt melting at 197—198° C.—*P.J.* '87, xvii. 1049.

The identity of **Duboisine** with any other of the mydriatic alkaloids has not as yet been proved, but it is extremely probable that it is a mixture in varying proportions of Hyoscyamine and Hyoscine.—*P.J.* xx. 709, xxii. 59.

### Preparations.

**DUBOISINÆ SULPHAS.**—Amorphous, hygroscopic. Very soluble in Water.

It dilates the pupil; its action is quicker, more powerful, and more transient than Atropine. Its application, however, sometimes causes toxic symptoms.

Recommended as a sedative in certain excited mental conditions (delirium and mania), in doses of $\frac{1}{130}$ to $\frac{1}{64}$ grain.—*B.M.J.E.* '93, ii. 52, 76, 84.

(Dutch; not in the other Pharmacopœias.,

**GUTTÆ DUBOISINÆ SULPHATIS** (*L.O.H.*).—Sulphate of Duboisine 1 gr.; Distilled Water 1 oz.

**Antidotes.**—The same as for Atropine.

Not Official.

## DUGONG OIL.

An oil obtained in Australia from *Helacore Australis* and *H. Dugong* by boiling the superficial fat. A substitute for Cod-Liver Oil, recommended at one time (*P.J.* iii. 100) as not being disagreeable in taste, but does not possess this character now.

Not Official.

## DULCAMARA.

The dried young branches of *Solanum dulcamara* (Bittersweet), from indigenous plants which have shed their leaves.

This is now omitted from the British Pharmacopœia.

(Austr., Belg., Fr. (Douce-amère), Ital., Norw., Port. (Doce-amarga), Span., Swed., Swiss and U.S.; not in Dan., Dutch, Ger., Hung. or Russ.

**Medicinal Properties.**—Narcotic. Increases the secretions, particularly of the kidneys and skin. Used in cutaneous eruptions, chiefly of a scaly nature, as psoriasis and pityriasis, a decoction being applied externally, at the same time that it is used internally. Also in chronic rheumatism and catarrh.

### Preparations.

**EXTRACTUM DULCAMARÆ FLUIDUM** (U.S.).

1 fl. oz. equals 1 oz. Dulcamara. Prepared with Diluted Alcohol.

**Dose.**—30 to 60 minims.

**INFUSUM DULCAMARÆ.**

Dulcamara, 1; boiling Water, 10: infuse one hour.

**Dose.**—1 to 2 oz.

(Fr. (Tisane), 1 in 50; not in the other Pharmacopœias.)

**SOLANINE.**—An Alkaloid obtained from *Solanum nigrum*, *S. dulcamara*, and *S. tuberosum* (Potato plant).

It has been recommended as an analgesic.—*L.M.R.* '86, 496; '88, 242; *T.G.* '87, 56; '88, 630; L. '87, ii. 1097.

## ECBALLII FRUCTUS.

### SQUIRTING CUCUMBER FRUIT.

The fruit very nearly ripe of the Squirting Cucumber, *Ecballium elaterium*, from plants cultivated in Britain.

(Fr., Concombre Sauvage; Port., Pepinos de S. Gregorio; not in the others.)

## ELATERIUM.

### ELATERIUM.

*B.P.Syn.*—Extractum Elaterii.

A sediment from the expressed juice of the fruit of *Ecballium elaterium*, dried.

The fruit is cut lengthwise, the juice lightly pressed out, strained through a hair sieve, then allowed to deposit; the clear liquor being poured off, the sediment is thrown on a linen strainer to drain, and lastly dried on a porous brick with a gentle heat.

In light, friable, flat or slightly curved, opaque cakes about $\frac{1}{10}$ inch thick; pale green, greyish-green, or yellowish-grey, according to age.

**Tests.**—Does not effervesce with Acids; yields half its weight to boiling Rectified Spirit. Boiled with Water and the cooled mixture treated with Iodine affords little or no blue colour (absence or only a trace of Starch).

Treated by the method described for Elaterin, it should yield 25 per cent., or not less than 20 per cent., of that substance.

This method is very imperfect. It has been pointed out (*P.J.* xvi. 538 and xvii. 217) that the proper method is to exhaust with Chloroform, evaporate the solution, and wash the residue with Pure Ether to remove colouring matter.

A sample treated by the Official method yielded 5·75 per cent.; the same sample treated by the improved method of assay gave 23·5 per cent. of Elaterin.

(Port., Extracto de Pepinos de S. Gregorio; Swed., Elaterium Album; not in the others.)

**Medicinal Properties.**—A powerful hydragogue cathartic. Especially used in dropsical affections connected with cardiac or renal disease. Its administration in a debilitated state of the system requires caution.

**Dose.**—$\frac{1}{16}$ to $\frac{1}{2}$ grain; to prevent causing nausea it may be given with Henbane.

**Antidotes.**—Emollient and demulcent drinks and enemata, to be followed by small but repeated doses of Opium and the use of the warm bath.

## Preparation.

### ELATERINUM.

The active principle of Elaterium ($C_{20}H_{28}O_5$), eq. 348. A chemically neutral substance, in small colourless crystals, which have a bitter taste.

According to the Pharmacopœia, it may be obtained by exhausting Elaterium with Chloroform, adding Ether to the Chloroformic solution, collecting the precipitate, washing the latter with Ether, and purifying by recrystallisation from Chloroform; but a more correct method is given under the tests for Elaterium.

**Solubility.**—1 in 160 of Rectified Spirit; insoluble in Water.

**Tests.**—With melted Carbolic Acid it yields a solution which, on the addition of Sulphuric Acid, acquires a crimson colour, rapidly changing to scarlet. It is not precipitated from solution by Tannic Acid, nor by the salts of Mercury or of Platinum. Heated with access of air it first melts and then burns, leaving no residue.

**Dose.**—$\frac{1}{40}$ to $\frac{1}{10}$ grain.

(U.S.; not in the other Pharmacopœias.)

### PULVIS ELATERINI COMPOSITUS.

Elaterin, 1; Sugar of Milk, 39: rub them together in a mortar until they are reduced to fine powder and intimately mixed.

**Dose.**—$\frac{1}{2}$ gr. to 5 grains.

(U.S. (Trituratio), Elaterin, 1; Sugar of Milk, 9; not in the others.)

## ELEMI.

MANILA ELEMI.

A concrete resinous exudation, the botanical source of which is undetermined, but is sometimes referred to *Canarium commune.*

When fresh, soft, granular, resinous and colourless; but by keeping it becomes harder and of a pale yellow tint. Odour strong and fragrant, somewhat resembling Fennel and Lemon.

Moistened with Rectified Spirit it breaks up into small particles, which when examined by the microscope are seen partly to consist of acicular crystals.

It is imported from Manila.

Brazilian and Yucatan Elemis are Official in some of the Foreign Pharmacopœias.

(Austr., Belg., Dutch, Fr., Port., Russ., Span. and Swiss; not in the others.)

**Solubility.**—The greater part is soluble in Rectified Spirit, wholly soluble in Ether.

**Medicinal Properties.**—Analogous to those of Turpentine. For external use only.

### Preparation.

**UNGUENTUM ELEMI.**

Elemi, 1; Simple Ointment, 4: melt, strain, and stir till cold. =(1 in 5).

(Belg., Fr. (Onguent d'Arceus), Russ., Span. and Swiss, 1 of Elemi and 1 of Turpentine in 4 of Ointment; Dutch, 3 of Elemi, 2 of Turpentine, in 10 of Ointment; Port. 2 of Elemi and 1 of Turpentine in 10. Not in the others.)

It has a pleasant odour, and is used to keep open issues and setons.

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### Not Official.

## EMBELIA RIBES.

The Powdered Seeds are used in India as a remedy for tapeworm.—*L.* '87, ii. 199.

**Dose.**—1 to 4 drachms.

**ACIDUM EMBELICUM.**—Obtained from the Seeds. It is insoluble in Water, forms salts with Ammonia, Potash, and Soda.

**AMMONII EMBELAS.**—A tasteless crystalline salt, in red needles.

**Dose.**—3 to 6 grains in Honey or Simple Syrup.—*P.J.*, xix. 305.

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## EMPLASTRA.

PLASTERS.

The Emplastra of the British Pharmacopœia are as follows, the formulas for which will be found under the names of the drugs from which they are prepared:—

| | Proportion of active ingredients in the mass. |
|---|---|
| EMPLASTRUM AMMONIACI CUM HYDRARGYRO | (Mercury) 1 in 5. |
| EMPLASTRUM BELLADONNÆ . . . . . . | (Alcoholic Extract) 1 in 5. |
| EMPLASTRUM CALEFACIENS . . . . . . | (Cantharides) about 1 in 25. |
| EMPLASTRUM CANTHARIDIS . . . . . . . . . | (Cantharides) 1 in 3. |

| | Proportion of active ingredients in the mass. |
|---|---|
| EMPLASTRUM FERRI | (Peroxide of Iron) 1 in 11. |
| EMPLASTRUM GALBANI | (Galbanum) 1 in 11. |
| EMPLASTRUM HYDRARGYRI | (Mercury) 1 in 3. |
| EMPLASTRUM MENTHOL | (Menthol) 1 in 5. |
| EMPLASTRUM OPII | (Opium) 1 in 10. |
| EMPLASTRUM PICIS | (Pitch) 1 in 2. |
| EMPLASTRUM PLUMBI. | |
| EMPLASTRUM PLUMBI IODIDI | (Iodide of Lead) 1 in 10. |
| EMPLASTRUM RESINÆ | (Resin) 1 in 9½. |
| EMPLASTRUM SAPONIS | (Soap) about 1 in 7. |
| EMPLASTRUM SAPONIS FUSCUM | (Soap) about 1 in 6. |

Plasters which are not Official are enumerated in the Index.

## ENEMATA.

ENEMAS.

The following are the Enemas of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared :—

| | In each Enema. |
|---|---|
| ENEMA ALOES | 40 grs. Aloes. |
| ENEMA ASAFŒTIDÆ | 30 grs. Asafœtida. |
| ENEMA MAGNESII SULPHATIS | (Catharticum) 1 oz. Sulphate. |
| ENEMA OPII | ½ drm. Tincture. |
| ENEMA TEREBINTHINÆ | 1 oz. Oil. |

John Arden, who flourished in the fourteenth century, treated largely with Clysters, and considered Salt a necessary and an important ingredient.

## ERGOTA.

ERGOT.

The sclerotium of *Claviceps purpurea,* produced between the pales and replacing the grain of the common rye, *Secale cereale.**

The two commercial varieties are Spanish and Russian. The former is considered the best.

It has a characteristic odour, which is increased by the addition of Solution of Potash.

Yields its virtues to Water and Alcohol.

It contains about 33 per cent. of fixed Oil, which can be extracted with Ether, Petroleum Ether, and also to a great extent by hydraulic pressure.

The chemistry of Ergot is so complicated, and the workers so utterly at variance both as to its constituents and their physiological action, that it is impossible to lay down any definite lines on which galenical preparations should be made. Differences in composition and activity between the Spanish and Russian varieties probably assist the confusion.

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* Ergot is common on grasses, and if it occurs in the pastures where cattle feed, it is said to occasion dry gangrene, causing the cattle to lose their hoofs and horns.

During an epidemic of *Secale cornutum* it was noticed that one of the symptoms of ergot-poisoning was suppression of milk in lactating women. The same result followed in cows that had been fed on meal containing Ergot.—*M. T.* '75, i. 586.

The more recent papers by Kobert are summarised (*C.D.* '90, ii. 551), but it must be noted that many of his results are not only questioned but flatly contradicted by Tanret.

According to Kobert the most active constituent is **Cornutine,** which together with Sphacelinic Acid is contained in a rectified spirit extract after removal of Oil by Petroleum Ether.

He also states that no aqueous extract of Ergot will have any therapeutic value after having been made for nine months.

In this country it has been the general opinion that an ammoniated menstruum gave the most reliable preparation, but preference is given by Kobert to an acid (HCl) extractive as in U.S. and the previous Ger. (1882).

But after all the elaborate investigations he recommends freshly powdered Ergot for certainty of action.

Ergot is stated (*P.J.* xvi. 274) to keep much better if a large proportion of the Oil has been extracted by hydraulic pressure; this, however, is disputed (*C.D.* '90, ii. 552), it is there recommended to keep the drug whole, in air-tight vessels and perfectly dry.

(Austr., Belg., Dan., Dutch, Ger., Hung., Norw., Russ., Swed. and Swiss, Secale cornutum; Fr., Ergot de Seigle; Ital., Segala Cornuta; Port., Cravagem de Centeio; Span., Cornezuelo de Centeno; U.S., Ergota.)

**Medicinal Properties.**—Produces contraction of the uterus, especially in parturition. Employed in uterine hæmorrhage and floodings, also in hæmoptysis, hæmatemesis, and epistaxis. Useful in amenorrhœa and dysmenorrhœa. In diabetes insipidus, 30 minim doses of the Liquid Extract every three hours.—*L.M.R.* '80, 231, 446; '81, 12.

In hiccough (*L.* '85, ii. 276); in post-partum hæmorrhage, equal parts Liq. Ergotæ and Acid. Acetic. diluted with Water (*B.M.J.* '88, i. 295, 1148); in the sweats of phthisis (*L.M.R.* '81, 451).

**Dose.**—20 to 30 grs., infused in boiling Water, to cause uterine contraction.

**Incompatibles.**—Astringents, Metallic Salts.

## Preparations.

### EXTRACTUM ERGOTÆ LIQUIDUM.

Ergot, crushed, 16; Distilled Water, 120; Rectified Spirit, 6. Digest the Ergot in 80 of the Water for twelve hours: draw off the infusion and repeat the digestion with the remainder of the Water. Press out, strain, and evaporate the liquors by a water bath to 11, and when cold add the Spirit. Allow it to stand for an hour to coagulate; filter, and make up the quantity to 16. =(1 in 1).

16 oz. of the Liquid Extract evaporated leaves about 2¼ ounces of solid Extract.

**B.P.Dose.**—10 to 30 minims. But 60 minims is not unfrequently prescribed.

(Dan., Ger. and Russ. Extract with Hydrochloric Acid and dilute Alcohol; U.S. percolated with diluted Alcohol acidified with Acetic Acid; Swiss from solid Extract; not in the others.)

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S., have a **solid extract.**

### INFUSUM ERGOTÆ.

Ergot, crushed, 1; boiling Distilled Water, 40: infuse half an hour and strain. =(1 in 40).

Should be made fresh on each occasion.

**Dose.**—1 to 2 oz.; used also as an injection for gleet.

(Not in the other Pharmacopœias.)

### TINCTURA ERGOTÆ.

Ergot, finely comminuted, 1; Proof Spirit, 4: macerate forty-eight hours with 3 of the Spirit, agitating occasionally, pack in a percolator, let it drain, then pour on the remaining Spirit; when it ceases to drop, press, filter, and make up with Proof Spirit to 4. =(1 in 4).

**B.P.Dose.**—5 to 30 minims.

(Belg., Dutch and Port., 1 in 5; Russ. and Swiss, 1 and 10: all by weight; not in the others; U.S. (Vinum Ergotæ), 15 in 100.)

### ERGOTINUM.

Purified Extract of Ergot, commonly called Ergotin.

Evaporate 4 of Liquid Extract of Ergot by a water-bath to a syrupy consistence, and when cold mix with 4 of Rectified Spirit. Let it stand half an hour, then filter and evaporate the filtered liquid to the consistence of a soft Extract.

As pointed out (*P.J.* xix. 498), the Official directions should be made more definite, by evaporating the fluid Extract either to a fixed weight, specific gravity, or percentage of dry Extract, instead of to a "syrupy consistence." That this is interpreted very differently by different manufacturers is evident by the quantity of residue insoluble in 60 per cent. Spirit varying from 0 to 35 per cent.; an unpurified aqueous Extract yielding 48 per cent. insoluble under the same conditions.

If evaporated to sp. g. 1·3, which is our idea of a "syrupy consistence," the yield of Ergotine will be about 1 oz. from 16 oz. of Ergot.

As the usual wholesale price of Ergotine is only eight times that of Ergot, it is obvious that either a very inferior Ergot is used in its manufacture or some process employed giving three times that yield.

**B.P.Dose.**—2 to 5 grains.

In **pills** and for **hypodermic injection.**

(All the Pharmacopœias have a Solid Extract.)

### INJECTIO ERGOTINI HYPODERMICA.

Ergotin 100 grains; Camphor Water 200 grains: dissolve by stirring them together. =(10 in 27).

The solution should be made as required for use.

**Dose.**—3 to 10 minims for subcutaneous injection.

(Port. (Soluto de Ergotino com Glycerino), Ergotin 1, Glycerine 4, Water 5: all by weight.)

#### Not Official.

**TINCTURA ERGOTÆ AMMONIATA** (*B.P.C.*).—Ergot in No. 20 powder, 10 oz.; Aromatic Spirit of Ammonia sufficient to percolate 20 oz.

**Dose.**—10 to 60 minims.

**ACIDUM SCLEROTICUM.**—A weak acid obtained from Ergot by Dragendorff. It is used **hypodermically** $\frac{1}{3}$ to $\frac{3}{4}$ grain dissolved in Distilled Water or Thymol Water.—*P.J.* vi. 1001; *Y.B.P.* '84, 87.

**INJECTIO ACIDI SCLEROTICI HYPODERMICA.**—Sclerotic Acid Pure, 15 grs.; Glycerine 15 mins.; Water to 60 mins.: dissolve and add 1 per cent. of Carbolic Acid No. 1. **Dose,** 1 to 4 mins.—*London Hosp.*

**ERGOTININE.**—An alkaloid obtained from Ergot, insoluble in Water, soluble in Alcohol or Chloroform. Used in post-partum hæmorrhage by **hypodermic injection** of 5 to 10 minims of a solution containing $\frac{1}{50}$ grain in 20 minims.—*B.M.J.* '82, ii. 1004.

**EXTRACTUM SECALIS CORNUTI CORNUTINO-SPHACELINICUM (KOBERT).**—An Extract which combines the action of **Cornutine** and **Sphacelinic Acid,** an alkaloid and a resinous body, obtained by Kobert from Ergot. It is prepared by exhausting Ergot with strong Alcohol, and evaporating the liquid to an Extract, the fatty Oil being removed by Ether.

He does not give the dose of the above, but states that "the extract thus prepared is not well suited for subcutaneous injection," and "the dose cannot be foretold because the proportion of active principles present in Ergot varies exceedingly with the year and the district."—*Pr.* xxxiii., 409; xxxv., 414.

Not Official.

## ERIGERONTIS CANADENSIS OLEUM.

OIL OF CANADA FLEABANE.

A volatile Oil distilled from the fresh flowering herb *Erigeron Canadense;* it grows abundantly in the American Mint fields and frequently contaminates that Peppermint Oil, as shown by its insolubility in 85 per cent. Alcohol.—*Y.B.P.* '82, 214.

When rectified, the Oil, which is a terpene ($C_{10}H_{16}$), has a sp. g. ·850, and boils at 176° C.

A very pale yellow liquid, with neutral reaction.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Diuretic, tonic, and astringent. Chiefly employed for arresting internal hæmorrhage.

**Dose.**—5 to 10 minims every two or three hours.

Not Official.

## ERYTHROPHLÆUM.

CASCA BARK. SASSY BARK.

The bark of the *Erythrophlæum guinense.*

An ordeal bark used in West Africa.

Introduced as a heart tonic in 1877.

### Preparations.

**TINCTURA ERYTHROPHLÆI** (*B.P.C.*).—Casca Bark in No. 20 powder, 2; Rectified Spirit to percolate 20.

**Dose.**—5 to 10 minims.

**ERYTHROPHLÆINÆ HYDROCHLORAS.**—Soluble in Water.

The statement that it possessed local anæsthetic properties has given rise to a good deal of discussion, the result of which is not in favour of its use for that purpose.—*B.M.J.* '88, i. 317, 545, 604, 661, 1083; *L.* '88, i. 249, 346.

## ESSENTIÆ.

The following are Official; the formulas will be found under the names of the drugs from which they are prepared.

Essentia Anisi.—1 Oil in 5.

Essentia Menthæ Piperitæ.—1 Oil in 5.

## EUCALYPTI GUMMI.

### EUCALYPTUS GUM.

A ruby-coloured exudation, or so-called Red Gum, from the bark of *Eucalyptus rostrata* and some other species. Imported from Australia.

Under the name of Gummi Rubrum, this has been "Not Official" in every edition of the "Companion" since 1871.

**Tests.**—From 80 to 90 per cent. of it is soluble in cold Water, forming a neutral solution. It is almost entirely soluble in Rectified Spirit.

**Medicinal Properties.**—Astringent, principally used in diarrhœa and relaxed throat.

This gum adheres with great pertinacity to the mucous surfaces, and it is probably on this account that its astringency is more effective than that of Catechu, Kino, etc., although it contains less amount of astringent matter. The late Sir Ranald Martin introduced it into European practice.

**Dose.**—2 to 10 grains.

Not Official.

**EXTRACTUM GUMMI RUBRI LIQUIDUM.**—Red Gum, 7; Water, 21: dissolve, strain, and add Rectified Spirit, 1.

**Dose.**—30 to 60 minims in a wineglassful of water.

An excellent styptic; injected into the nostril, at once stays bleeding of the nose.

A tablespoonful in a pint of water forms an astringent **injection** for the vagina or rectum; it also forms an astringent **lotion** for the eyes.

**SUPPOSITORIA GUMMI RUBRI.**—Powdered Red Gum, 5 grs.; Extract Nux Vomica, 1 gr.; Cocoa-nut Stearine, *q.s.* to make one suppository.

Excellent for relaxed intestines and sphincter.

**SYRUPUS GUMMI RUBRI.**—Liquid Extract, 20; Sugar, 12: dissolve.

**Dose.**—30 to 60 minims.

**TINCTURA GUMMI RUBRI.**—Gum, 1; Rectified Spirit, 4: digest and strain. Mixes with water without becoming turbid.

If made with Proof Spirit it is very apt to become a solid jelly.

**Dose.**—20 to 40 minims.

1 part of this with 6 or 8 of Water for a **gargle.**

**TROCHISCI GUMMI RUBRI.**—Lozenges for relaxed throat.

They have also been recommended as a preventive of sea-sickness, using one when the sickness is apprehended, three or four may be taken during the day.

## EUCALYPTI OLEUM.

### OIL OF EUCALYPTUS.

The Oil distilled from the fresh leaves of *Eucalyptus globulus*, *Eucalyptus amygdalina*, and probably other species of *Eucalyptus*.

Colourless or pale straw-coloured, becoming darker and thicker by exposure. Neutral to Litmus. Sp. g. about ·900.

Has an aromatic odour, and a spicy and pungent flavour, leaving a sensation of coldness in the mouth.

The above description, taken from the B.P., '85, is almost word for word the same as that of *U.S.P.*, '82. It refers to Eucalyptus Oils as a class, but the physical and chemical characters of the Oils, obtained from different species, vary so much that some more detailed description is necessary. The distinction between the two principal varieties (the Oil from *E. globulus*, and the Oil from *E. amygdalina*) seems strongly marked. The former has a gravity over ·900 (generally ·915—·925), a weak dextro-rotary power, yields crystallisable Eucalyptol, and contains no Phellandren. The latter has a gravity below ·900 (generally ·880—·890), a lævo-rotary power, yields little or no crystallisable Eucalyptol, and consists largely of Phellandren, which may be recognised by dissolving the Oil in twice its volume of Glacial Acetic Acid, and adding a solution of Nitrite of Sodium ; Phellandren if present separates as an insoluble Nitrite. A pure Amygdalina Oil solidifies almost instantly ; a Globulus Oil, treated in the same way, assumes a green colour, but does not otherwise change. The boiling point of the two Oils appears not to differ to any definite extent. No comparative tests seem to have been made as to the therapeutic values of the different varieties.—*Companion*, 1890.

Since the above has been written, a large amount of attention has been given to this Oil, owing to its popularity as a remedy and prophylactic in epidemic influenza. For commercial purposes much stress has been laid upon the Eucalyptol contents of certain varieties of Oil ; this and freedom from traces of low boiling point aldehydes, being the only criteria proposed for the valuation of any given sample.

This might be correct on the supposition that it is to the crystallisable Eucalyptol that the therapeutic effects attributed to the Oil are really due ; but it must be borne in mind that if the original reputation of Eucalyptus Oil was not actually gained by the Oil of *E. Amygdalina*, this was, for many years, the most esteemed variety, and pending some trustworthy medical comparison between the two varieties, the assumed superiority of an Oil rich in Eucalyptol, such as that of *E. Globulus* and the new *Oleosa*, over the *Amygdalina* is very open to question, and still more the speaking of "Phellandren and other irritating compounds."—*See* also *P.J.* xxii. 877.

It has been suggested (*P.J.* xxii. 945) that both the Amygdalina and Globulus type of Oil may owe their value to Eucalyptol ; but we do not think this likely. It was for a long time supposed that Amygdalina Oil contained no Eucalyptol whatever, and it is certain that none can be obtained from it by any ordinary method of separation. Wallach and Gildermeister have reported the discovery of it in this Oil by the Hydrobromic Acid process, but no figures are given, and considering how much Oil of mixed origin has recently been sold as Amygdalina, we may say there is no conclusive evidence as to the presence of any notable quantity of Eucalyptol in real Amygdalina Oil.

We noted (*C.D.* '90, ii. 380) the existence of a commercial Oil allied to Amygdalina, but with a left-handed rotation three times as great as the ordinary variety, the origin of which has not yet been identified.

**Solubility.**—3 in 1 (or less) of Rectified Spirit, in all proportions of Absolute Alcohol ; in Proof Spirit :—E. Globulus, 1 in 38 ; E. Amygdalina, 1 in 175.

We found at one time that the sp. g. of samples of Oil varied ·881—·886, at another ·927—·935. Some samples of Eucalyptol obtained in England varied ·872—·882 ; but one obtained from a large distiller in Australia was ·947.

(Belg. ; Hung., sp. g. ·914 ; U.S., sp. g. ·915—·925 ; not in the others.)

**Medicinal Properties.**—It is a powerful antiseptic and deodorizer. It has been used in the treatment of wounds and in surgical operations; as an inhalation in cases of diphtheria; and to relieve the cough in chronic bronchitis, phthisis, and asthma. Mixed with Iodoform as an application to hard and soft chancres. Given internally for chronic inflammation of the bladder.

Eucalyptus antiseptic spray in eye operations.—*L.* '86, i. 305.

Inhalation in whooping cough.—*B.M.J.* '86, i. 430.

**B.P. Dose.**—1 to 4 minims.

### Preparation.

### UNGUENTUM EUCALYPTI.

Oil of Eucalyptus (by weight), 1; Soft Paraffin, 2; Hard Paraffin, 2. Melt the Paraffins together, add the Oil, and stir until cold. =(1 in 5.)

### Not Official.

**TINCTURA EUCALYPTI** (*B.P.C.*).—Eucalyptus Leaves (of the Eucalyptus globulus), in No. 20 powder, 4; Rectified Spirit to percolate, 20.

**Dose.**—15 to 120 minims.

(Belg., Dutch, Fr., Hung., Port., Span. and Swiss, 1 in 5; not in the others.)

**EUCALYPTUS GAUZE.**—Contains about 6 per cent. of Eucalyptus Oil.

**EUCALYPTUS WOOL and LINT.**—Each contains 10 per cent. of the Oil.

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### Not Official.

## EUCALYPTOL.

Till recently much doubt was prevalent as to the nature of the commercial product passing under this name; the general opinion being that any Eucalyptus Oil distilling between 175° to 177° C., treated with Potash, and rectified over Chloride of Calcium (according to the original process of Cloez) yielded Eucalyptol. After much involved controversy the following three commercial varieties have been defined:—

**Eucalyptol Crystallisable.**—A definite chemical body ($C_{10}H_{18}O$), obtainable, by a freezing process of purification, from the Oil of Eucalyptus globulus. It is liquid at ordinary temperatures, but crystallises about 0° C. (32° F.). It has sp. g. ·923 and has no action on polarised light. It is identical with an oxidised compound obtained from Oil of Cajuput and a number of other essential oils, consequently the names **Cineol** and **Cajuputol** have also been applied to it.

**Eucalyptol (Globulus)**, is generally understood commercially to be the product obtained by purification and rectification of the oil; it does not crystallise when cooled far below 0° C., but contains a large proportion of *Crystallisable Eucalyptol.*

**Eucalyptol (Amygdalina)**, obtained by rectification of the oil from E. Amygdalina, consists mainly of Phellandren, having the formula $C_{10}H_{16}$, and a sp. g. about ·886. Whether this oil, when unmixed with oils from other species, contains any crystallisable Eucalyptol is yet undecided, but in any case the quantity is probably very small.

(U.S. sp. g. ·930, boiling point 176°—177° C.)

# EUONYMI CORTEX.

EUONYMUS BARK.

*N.O.Syn.*—Wahoo Bark.

The dried root-bark of *Euonymus atropurpureus.*

Following the lines suggested in last edition of "Companion," the root-bark has now been made Official, to the exclusion of the stem-bark, which yields a less active extract.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Cholagogue and laxative.

## Preparation.

### EXTRACTUM EUONYMI SICCUM.

Moisten 16 oz. of Euonymus Bark, in No. 20 powder, with 8 oz. of a mixture of Rectified Spirit and Distilled Water equal parts; pack it in a percolator, then pour on gradually more of the diluted Spirit until the Euonymus is exhausted. Collect the liquor and evaporate or distil off the Spirit. Incorporate so much Sugar of Milk with the still fluid Extract—the actual amount having been ascertained experimentally—that the final product shall contain 80 per cent. of the dry extractive. Then evaporate over a water-bath until the mixture when cold becomes brittle. The mass may be powdered and kept in a well-corked bottle.

**B.P.Dose.**—1 to 4 grains.

We find that 16 oz. of Euonymus Bark treated by the Official process yielded 4 oz. of dry Extract, of which $\frac{3}{4}$ oz. was Milk Sugar. Although deliquescent the product could with care be powdered, but when kept even in a stoppered bottle it set to a hard mass.—*Companion Supplement*, 1891.

At the B.P. Conference, '91, a discussion initiated by Mr. Conroy showed unmistakably that the product resulting from the above Official process was most unsatisfactory.—*P.J.* xxii. 190 ; *C.D.* '91, ii. 280, 374, 418.

The B.P. "Additions," '90, do not Officially recognise Euonymin as a synonym, but simply remark that "Dry Extract of Euonymus is commonly known as Euonymin."

Previous to its introduction into the Pharmacopœia attention had been directed to **Euonymin** on account of the variety and extent of the adulterations practised. Instead of being as was supposed a proximate principle embodying the medicinal properties of the plant, commercial Euonymin has been discovered to be an aqueous or alcoholic extract dried up with Phosphate of Calcium, Lycopodium, Sugar of Milk, finely powdered bark, Magnesia, Baryta, and Alumina. The two latter were apparently precipitated in the Euonymin solution, to carry down the chlorophyll in making the green variety. The amount of added material constituted 30 to 60 per cent. of the drug.

Experiment has shown that a powdered proof spirit extract represents the full medicinal activity of the bark and that Magnesia is the least objectionable as well as the most effective desiccating material. The total ash should in no case exceed 15 per cent. (with much less than this the powder is inclined to cake), and be readily soluble in dilute acids. The Euonymin should yield at least 85 per cent. of its weight to Proof Spirit and be completely soluble with the addition of Hydrochloric Acid.

This Euonymin possesses advantages over the fluid preparations in that it can be prescribed in **pills**, which has been the usual method of administration.

*Is a powerful hepatic, but feeble intestinal stimulant.—Dr. Rutherford.*

Not Official.

**EXTRACTUM EUONYMI** (*U.S.*).—Percolate Euonymus in No. 30 powder with Diluted Alcohol until exhausted, distil off the Alcohol and evaporate over a water-bath to a pilular consistence.

**TINCTURA EUONYMI** (*B.P.C.*).—Euonymus bark in No. 20 powder, 4; Rectified Spirit sufficient to percolate 20.

**Dose.**—10 to 40 minims.

Not Official.

## EUPHORBIA PILULIFERA.

A plant growing in Queensland and Tropical America. The herb is collected when in flower and carefully dried.

It has been recommended in asthma and bronchial affections.—*L.* '85, ii. 86; *T.G.* '85, 92.

### Preparations.

**EXTRACTUM EUPHORBIÆ PILULIFERÆ.**—Obtained by the evaporation of the Proof Spirit Tincture.

**Dose.**—$\frac{1}{2}$ to 1 grain.

**TINCTURA EUPHORBIÆ PILULIFERÆ** (*B.P.C.*).—Euphorbia in No. 20 powder, 4; Proof Spirit to percolate 20.

**Dose.**—10 to 30 minims.

Not Official.

## EXALGINE.

METHYLACETANILIDE.

$C_6H_5N(CH_3)CH_3CO$.

This crystalline substance, which was described by Hofmann in 1874, has been more recently submitted to physiological experiment and found to possess analgesic and, to a much less degree, antipyretic properties.

**Solubility.**—1 in 50 of Water; 1 in 2 of Rectified Spirit; 1 in 4 of Proof Spirit; 1 in 2 of Chloroform; 1 in 10 of Ether.

In hot Water Exalgine is very apt to form supersaturated solutions, which when cold will not separate even when stirred or scratched, but set solid at once on the addition of a fragment of crystal.

**Medicinal Properties.**—In small doses it acts as an analgesic without other effects, giving the best results in neuralgia and toothache. *B.M.J.* '90, i. 344, 558; '90, ii. 735; *P.J.* xix. 781, 861; *T.G.* '89, 339, 534, 746, 797; *L.* '90, ii. 845; '89, i. 658; '92, i. 1174, 1175; '93, i. 785.

In large doses it possesses toxic properties.

**Dose.**—$\frac{1}{2}$ to 1 grain was found sufficient by Fraser, but larger doses, 4 to 8 grains, have been given in France.

# EXTRACTA.

## EXTRACTS.

The following is a complete list of the Extracts of the British Pharmacopœia, the mode of preparation for which will be found under the names of the drugs from which they are prepared:—

| B.P. DOSE. | EXTRACTUM. | MENSTRUUM. |
|---|---|---|
| ¼ to 1 gr. | ACONITI (juice of fresh herb). | |
| 2 to 6 grs. | ALOES BARBADENSIS. | Boiling water. |
| 2 to 6 grs. | ALOES SOCOTRINÆ. | Boiling water. |
| 2 to 10 grs. | ANTHEMIDIS (dried flowers and oil). | Boiling water. |
| 1 to 2 drms. | BELÆ LIQUIDUM (dried fruits). | Cold water. |
| ¼ to 1 gr. | BELLADONNÆ (juice of fresh herb). | |
| $\frac{1}{16}$ to ¼ gr. | BELLADONNÆ ALCOHOLIC (root). | Rectified spirit. |
| 2 to 10 grs. | CALUMBÆ (dried root). | Proof spirit. |
| ¼ to 1 gr. | CANNABIS INDICÆ (dried herb). | Rectified spirit. |
| 2 to 8 grs. | CASCARÆ SAGRADÆ (dried bark). | Proof spirit and water. |
| ½ to 2 drms. | CASCARÆ SAGRADÆ LIQUIDUM. | Boiling water. |
| 3 to 30 mins. | CIMICIFUGÆ LIQUIDUM. | Rectified spirit. |
| 5 to 10 mins. | CINCHONÆ LIQUIDUM (Red bark). | Hydrochloric acid, glycerine and water. |
| ½ to 2 drms. | COCÆ LIQUIDUM (dried leaves). | Proof spirit. |
| ½ to 2 grs. | COLCHICI (juice of fresh corms). | |
| ½ to 2 grs. | COLCHICI ACETICUM (fresh corms). | Acetic Acid. |
| 3 to 10 grs. | COLOCYNTHIDIS COMPOSITUM. | Proof spirit. |
| 2 to 6 grs. | CONII (juice of fresh herb). | |
| 10 to 30 mins. | ERGOTÆ LIQUIDUM (dried Ergot). | Cold water. |
| 1 to 4 grs. | EUONYMI SICCUM. | Spirit 1, water 1, mixed. |
| 15 to 30 mins. | FILICIS LIQUIDUM (dried rhizome). | Ether. |
| ½ to 2 grs. | GELSEMII ALCOHOLICUM (rhizome). | Rectified spirit. |
| 2 to 10 grs. | GENTIANÆ (dried root). | Boiling water. |
| 5 to 60 grs. | GLYCYRRHIZÆ (dried root). | Cold water. |
| 1 drm. | GLYCYRRHIZÆ LIQUIDUM. | Cold water. |
| 10 to 30 grs. | HÆMATOXYLI (chips). | Boiling water. |
| 2 to 5 mins. | HAMAMELIDIS LIQUIDUM. | Spirit 1, water 2, mixed. |
| 5 to 30 mins. | HYDRASTIS LIQUIDUM. | Spirit 1, water 1, mixed. |
| 5 to 10 grs. | HYOSCYAMI (juice of fresh herb). | |
| 2 to 10 grs. | JABORANDI (dried leaves). | Proof spirit. |
| 5 to 15 grs. | JALAPÆ (dried root). | Spirit and cold water. |
| 5 to 20 grs. | KRAMERIÆ (dried root). | Cold water. |
| 5 to 15 grs. | LACTUCÆ (juice of fresh flowering herb). | |
| 5 to 15 grs. | LUPULI (dried). | Spirit and boiling water. |
| | MEZEREI ÆTHEREUM (dried bark). | Spirit and ether. |
| ¼ to 1 gr. | NUCIS VOMICÆ (standardised). | Spirit 4, water 1, mixed. |
| ½ to 2 grs. | OPII (standardised). | Cold water. |
| 10 to 40 mins. | OPII LIQUIDUM (standardised). | Cold water and spirit. |
| 2 to 5 grs. | PAPAVERIS (dried capsules). | Boiling water. |
| 10 to 30 grs. | PAREIRÆ (dried root). | Boiling water. |
| ½ to 2 drms. | PAREIRÆ LIQUIDUM (extract). | Water and spirit. |
| $\frac{1}{16}$ to ¼ gr. | PHYSOSTIGMATIS (Calabar bean). | Rectified spirit. |
| 3 to 5 grs. | QUASSIÆ (chips). | Cold water. |

| B.P. DOSE. | EXTRACTUM. | MENSTRUUM. |
|---|---|---|
| 15 to 60 grs. | RHAMNI FRANGULÆ (dried bark). | Proof spirit and water. |
| 1 to 4 drms. | RHAMNI FRANGULÆ LIQUIDUM. | Boiling water. |
| 5 to 15 grs. | RHEI (dried root). | Proof spirit and water. |
| 2 to 4 drms. | SARSÆ LIQUIDUM (root). | Proof spirit, water (at 160° F.), and sugar. |
| $\frac{1}{4}$ to $\frac{1}{2}$ gr. | STRAMONII (dried seeds). | Ether (rejected) and proof spirit. |
| 5 to 30 grs. | TARAXACI (juice of fresh root). | |
| $\frac{1}{4}$ to 2 drms. | TARAXACI LIQUIDUM (dried root). | Proof spirit and water. |

Extracts which are not official are enumerated in the Index.

## FARINA TRITICI.

### WHEATEN FLOUR.

The grain of Wheat, *Triticum sativum*, ground and sifted.

(Port. and Span., Trigo; not in the other Pharmacopœias.)

Used only for Cataplasma Fermenti.

Made into a paste with honey, is an excellent application for boils.

**Bran bread** and **biscuits,** also those of **Gluten,** are made for the food of diabetic patients.

## FEL BOVINUM PURIFICATUM.

### PURIFIED OX BILE.

Fresh Ox Bile, 20; Rectified Spirit, 10: evaporate the Fresh Ox Bile to 5, and mix it with the Rectified Spirit; agitate, and set aside for twelve hours, then decant the clear liquor, filter the remainder, washing the contents of the filter with a little more Spirit. Distil off the Spirit, and evaporate the residue over a water bath to a pill consistence.

The Ox Bile is now evaporated before adding the Spirit, which is a saving of Spirit.

**Solubility.**—Soluble in Water and in Rectified Spirit. Insoluble in Ether.

**Tests.**—Its watery solution gives no precipitate on the addition of Rectified Spirit. 1 or 2 grs. dissolved in about 1 drm. of Water, then treated with a drop of freshly made syrup (Sugar 1, Water 4), and then with Sulphuric Acid cautiously added until the precipitate first formed is redissolved, gradually acquires a cherry-red colour, which changes in succession to carmine, purple, and violet.

(Belg. (Fel Bovinum Depuratum), Swed. (Bilis Bovina Depurata), equal weights of Gall and Rectified Spirit; Ital. (Bile Crystallizzata di Platner); Port. (Extracto de Fel de Boi), Gall 1, Alcohol 1, Animal Charcoal $\frac{1}{10}$; U.S. (Fel Bovis Purificatum), Ox Gall 3, concentrated to 1, Alcohol 1; not in others. Fr. (Extrait de Fiel de Bœuf), Span. (Extracto de Hiel); Gall evaporated, without purification by spirit.)

**Medicinal Properties.**—Alterative and laxative. Used where there is a deficiency of bile.

**Dose.**—5 to 10 grs.

It is not desirable that it should come in contact with the stomach, hence the pills should be coated with Keratin Solution, p. 330.

8 oz. Ox Bile, diluted with 8 oz. Water and a few crystals of washing Soda, used as an **enema**, is sometimes useful in severe cases of intestinal obstruction.—*L.* '78, ii. 276, 316.

## FERMENTUM.

*See* CEREVISIÆ FERMENTUM.

## FERRUM.

IRON.

Fe, eq. 56.

Annealed iron wire, having a diameter about ·005 of an inch (about No. 35 wire gauge), or wrought iron nails; free from oxide.

It is curious to note that the only apparent Official use of Iron Nails is for making Syrupus Ferri Iodidi, Iron Wire being specified in all other cases where Metallic Iron is used. Until 1885 Iron Nails were not Officially permitted even for this purpose.

Sp. g. 7·8; fuses about 2786° F. The use of Iron in medicine is of great antiquity; it is said to have been the first mineral used internally, more than 3000 years ago.

Iron Salts naturally divide into two groups; the Ferrous or Protosalts based upon the Oxide FeO, and the Ferric or Sesquisalts (Persalts) based upon the Oxide $Fe_2O_3$. Ferrous Salts have a strong tendency to pass into the Ferric condition by absorption of atmospheric Oxygen, a change which takes place very rapidly in presence of oxidising agents, as Chlorine, Nitric Acid, &c.

Ferrous Salts as a rule are pale green in colour; give a blue precipitate with Ferricyanide (not Ferrocyanide) of Potassium; do not give a red colour with Sulphocyanide of Potassium.

Ferric Salts give a blue precipitate with Ferrocyanide (not Ferricyanide), and an intense blood-red colour with Sulphocyanide of Potassium; they yield a deep violet purple with Salicylate of Sodium.

(Austr., Dan., Dutch, Ger., Hung., Norw., Russ., Swed. and Swiss, Ferrum Pulveratum; Belg., Limatura Ferri, also ditto Porphyrisata; Fr., Fer Metallique; Ital. and Port., Ferro; Span., Hierro; U.S., Ferrum.)

**Medicinal Properties.**—Metallic Iron would exert no action in the living system, were it not for the acid which it generally meets with in the stomach. It is given in the state of fine division, as Ferrum Redactum. The Peroxide was formerly used in the shape of Ferrum Præcipitatum, but latterly the Saccharo-Carbonate of Iron and the Ammonio-Citrate of Iron, Dialysed Iron and Chloroxyde of Iron have taken its place. The Phosphates are much used, and the Tincture of the Perchloride, formerly called Sesquichloride, is still a favourite and reliable preparation.

Of the preparations of Iron, some are astringent, and the astringent forms are pre-eminently tonic, and peculiarly well fitted to improve the quality of the blood when impoverished from any cause. Hence they are useful in diseases characterised by debility, especially in anæmia, associated with or consequent upon inordinate discharges. The diseases in which they are usually employed are chronic anæmia, dyspepsia, when dependent on deficient energy of the digestive function, and neuralgia. They are contra-indicated in acute inflammatory diseases, producing, when injudiciously employed, headache, and other symptoms, of an excited circulation.

### Preparations.

**MISTURA FERRI AROMATICA.**

Fine Iron Wire, 2; Red Cinchona Bark, in powder, 4; Calumba, in coarse powder, 2; Cloves, bruised, 1; Compound Tincture of Cardamoms, 12; Tincture of Orange Peel, 2; Peppermint Water, 48: macerate the first four ingredients in the last one for three days in a closed vessel, agitating occasionally, filter, and make up with Peppermint Water to 50; to this add the Tinctures, and preserve in a well-stoppered bottle.

**Dose.**—1 to 2 oz.

Much valued in Dublin as a tonic.

(Not in the foreign Pharmacopœias.)

**SYRUPUS FERRI SUBCHLORIDI.** *B.P.Syn.*—Syrup of Ferrous Chloride.

Iron Wire, 300 grs.; Hydrochloric Acid, 2 oz.; Citric Acid, 10 grs. Distilled Water, 10 drms.; Syrup, a sufficiency: mix the Hydrochloric Acid with 1 oz. of the Water in a flask, add the Iron Wire, and apply heat gently until action ceases. Remove the flask from the source of heat, add the Citric Acid, and filter the solution through paper into 10 oz. of the Syrup, then pass the remainder of the Water through the small filter into the Syrup. To the product add sufficient Syrup to form 1 pint of the thoroughly mixed fluid. Its specific gravity should be about 1·340.

The above quantities heated to 150° F. for two hours, by which time effervescence had entirely ceased, left a residue weighing 64 grs.; a fluid drachm of the finished Syrup will therefore contain about 3½ grs. of anhydrous Ferrous Chloride.

The Official term "Subchloride" has possibly been chosen to distinguish this preparation from a Syrupus Ferri Protochloridi of varying strengths, which has been recommended at intervals since its first mention by Phillips in 1845.

It would appear that the formula for this Syrup has been so arranged that the B.P. maximum dose will contain the same quantity of Iron (1½ grs.) as the B.P. maximum dose of Tinctura Ferri Perchloridi.

60 minims are equal in Iron to 30 minims of Tincture of Steel.

**Dose.**—½ to 1 drachm.

**VINUM FERRI.**

Iron Wire, 1 oz.; Sherry, 20 oz.: macerate for thirty days with frequent agitation, the Iron not being wholly immersed. The bottle to be uncorked after each agitation.

The quantity of Iron dissolved seems to depend almost wholly upon the acidity of the Wine. We found that a good dinner Sherry containing Acids equal to ·396 per cent. of Acetic Acid, dissolved ·14 per cent. of Iron, and had its acidity reduced to ·09 per cent. It was treated as directed in the B.P., and the bottle was about half full.

Of such a Vinum Ferri, 3 drachms would represent the Iron contained in 5 minims of Tinctura Ferri Perchloridi.

Commercial samples seem to lie between ·2 and ·3 per cent. of Iron, although occasionally samples are found much weaker.

According to *P.J.* xxi. 641, the Iron strength increases for three weeks and then diminishes. Our experience does not agree with this. A gallon quantity was put on and examined after the first week and afterwards every month for four months with the following results, ·084, ·114, ·157, ·185, ·204 per cent. of Metallic Iron.

It has been suggested that, in the next B.P., Vinum Ferri should be deleted and the name applied to Vinum Ferri Citratis.

N.B.—The old Vinum Ferri, made with Malaga, is much sweeter than that of the British Pharmacopœia, and is sometimes ordered on that account.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—Useful in restoring the blood, when a slight astringent is desired.

**Dose.**—1 to 4 drms.

### Not Official.

**EXTRACTUM POMI FERRATUM.**—Sour Apples, 50; convert them into a pulp and express; to the expressed liquid add Iron Wire 1; heat the mixture on a water-bath until the evolution of gas ceases. Dilute the liquid with Water to make 50 parts, and set it aside for several days; then filter and evaporate to a thick extract. The extract should be a greenish-black, and should form a clear solution with Water.

**Dose.**—3 to 10 grains.

(Austr. and Hung., Ext. Malatis Ferri; Dan., Ext. Pomi Ferratum; Ger., Russ. and Swiss, Ext. Ferri Pomatum; Norw. and Swed., Ext. Pomorum Ferratum. Swiss is prepared by dissolving freshly precipitated Peroxide of Iron in Apple Juice; all the others are with Metallic Iron and Apple Juice.)

**TINCTURA POMI FERRATI.**—Ferrated Extract of Apples, 1; Rectified Spirit, 1; Cinnamon Water to make 10.

**Dose.**—30 to 90 minims.

(Austr., Dan., Hung., Norw. and Swed., 1 and 5; Ger., Russ, and Swiss, 1 and 9; not in the others.)

**MALATE OF IRON WINE.**—In Devonshire a quantity of Iron Wire or Nails is digested in a bottle of Cider for a week, and a wineglassful three times a day is the dose.

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## FERRI ACETATIS LIQUOR FORTIOR.

### STRONG SOLUTION OF ACETATE OF IRON.

Mix Solution of Ammonia 8 with Distilled Water 20, to this add gradually Solution of Persulphate of Iron 5, previously diluted with Distilled Water 20; stir the whole together, taking care that Ammonia is even finally in slight excess, as indicated by the odour of the mixture. Let the whole stand two hours, stirring occasionally; collect on calico, drain, and wash with Distilled Water until the filtrate ceases to precipitate with Chloride of Barium. Squeeze out the superfluous moisture, and dissolve the Ferric Hydrate in 3 of liquefied Glacial Acetic Acid, and make the volume up to 10 with Distilled Water.

A deep-red fluid with a sour styptic taste and acetous odour.

Miscible with Water and Rectified Spirit in all proportions.

Sp. g. 1·127.

**Test.**—1 fluid drachm diluted with 2 oz. Distilled Water gives with excess of Ammonia a reddish-brown precipitate, which when washed and ignited weighs 5·7 grains.

This solution will not react with Sulphocyanide of Potassium except in the presence of a free Mineral Acid (not Phosphoric); neither will it liberate Iodine from Iodide of Potassium.

**B.P.Dose.**—1 to 8 minims.

(Ger., Russ. and Swiss, sp. g. 1·087—1·091; Swed., sp. g. 1·134—1·138; U.S., sp. g. 1·160; not in the others.)

### Preparations.

### LIQUOR FERRI ACETATIS.

Strong Solution of Acetate of Iron, 5; Distilled Water to make 20. =(1 in 4).

Sp. g. 1·031.

**Dose.**—5 to 30 minims.

### TINCTURA FERRI ACETATIS.

Strong Solution of Acetate of Iron, 5; Acetic Acid, 1; Rectified Spirit, 5; Distilled Water, 9: mix, and add sufficient Distilled Water to make 20. Preserve in a stoppered bottle. (=1 in 4).

**Dose.**—5 to 30 minims.

This is a great improvement on the Tincture of B.P. '67, and keeps very well.

(Dutch, Ger., Russ., Swed. and Swiss, with Acetic Ether, *see below.*)

### Not Official.

**TINCTURA FERRI ACETICI ÆTHEREA—**

Dutch, Solution of Acetate of Iron, 100; Strong Spirit, 12; Acetic Ether, 8.

Ger. and Swiss, Solution of Acetate of Iron (sp. g. as above), 8; Alcohol, 1; Acetic Ether, 1.

Russ., Solution of Acetate of Iron (sp. g. as above), 9; Rectified Spirit, 2; Acetic Ether, 1.

Swed., Solution of Acetate of Iron (sp. g. as above), 15; Rectified Spirit, 3; Acetic Ether, 2.

All by weight.

**Dose.**—10 to 20 minims.

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### Not Official.

## FERRI ALBUMINAS.

A liquor is official in the Dutch Pharmacopœia containing ·25 per cent. of Ferric Oxide, and several other formulas have been proposed, but it is more convenient to use the commercial scale preparation, which is fairly soluble in Water, and contains 5 per cent. of Ferric Oxide.

(Dan., Ger., Russ. and Swiss, Liquor Ferri Albuminati, containing 0·4 p. c. of Iron.)

**Medicinal Properties.**—Given in anæmia and specially recommended in gastric ulcer.—*T.G.* '86, 399.

**Dose.**—3 to 10 grains.

## FERRI ARSENIAS.

### ARSENIATE OF IRON.

Arseniates of Iron, with some Oxide; prepared by precipitating Sulphate of Iron with Arseniate and Bicarbonate of Sodium, washing the precipitate and finally drying it at a temperature not exceeding 100° F. (37·8° C.)

A tasteless amorphous powder, of a greenish colour; insoluble in Water, but readily dissolved by Hydrochloric Acid.

**Tests.**—A small quantity, boiled with an excess of Caustic Soda and filtered, gives when exactly neutralised by Nitric Acid, a brick-red precipitate with solution of Nitrate of Silver. The solution in Hydrochloric Acid when diluted gives no precipitate with Chloride of Barium—absence of Sulphuric Acid; but a copious light-blue precipitate with Ferrocyanide of Potassium (Ferric Iron), and a still more abundant one of a deeper colour with Ferricyanide of Potassium (Ferrous Iron). 100 grains dissolved in an excess of Sulphuric Acid diluted with Water continue to give a blue precipitate with the Ferricyanide of Potassium, until at least 225 grain-measures of the volumetric Solution of Bichromate of Potassium have been added; that is to say, it must contain sufficient Ferrous Salt to require this quantity of Bichromate of Potassium to convert it all into Ferric Salt.

(Belg. Fr., Ital. and Span.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Similar to those of Arsenious Acid.

**Dose.**—$\frac{1}{16}$ gr., gradually increased to $\frac{1}{2}$ gr. in a pill, three times daily.

**Antidotes.**—*See* Acidum Arseniosum.

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### Not Official.

## FERRI BROMIDUM.

The Commercial Salt is in greyish-white crystalline masses, coated with red insoluble Oxybromide, which amounts to about ·5 p. c.

It generally contains about 18 p. c. of Water, corresponding with the formula $FeBr_2.3H_2O$. When this is not allowed for, a Syrup or Liquor made from the solid Bromide will be proportionately weaker than when made from Iron Wire and calculated as if anhydrous, which is done in the preparations that follow.

### Preparations.

**LIQUOR FERRI BROMIDI FORTIS.**—A clear green liquid. Sp. g. 1·554.

Each fluid drachm contains 36 grs. of Bromide of Iron ($FeBr_2=216$).

This solution keeps well in a corked bottle, with bright Iron Wire immersed in it, and on filtration gives a clear green liquid.

A small quantity of Hypophosphorous Acid is now commonly used for the same purpose. With this addition the Liquor will keep without any precautions, and may even be exposed to the air for some days without depositing.

(Fr., 33 p.c.; Port., Brometo Ferroso (solid, no solution); not in the others.)

**SYRUPUS FERRI BROMIDI.**—Strong Solution of Bromide of Iron (filtered), 1; Simple Syrup, 7: mix.

Contains 4½ grs. of Bromide of Iron in each drachm.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—A tonic in anæmia, chlorosis, and amenorrhœa.

**SYRUPUS FERRI BROMIDI** (*B.P.C.*).—Iron Wire free from oxide, ½ oz.; Bromine 533 grs.; Refined Sugar 14 oz.; Distilled Water a sufficiency. Dissolve the Sugar in 6 oz. of the Water in a water-bath. Put the Iron Wire with 4 oz. of the Water into a glass flask, having a capacity of at least 20 oz., and surround it with cold water, and add the Bromine in successive quantities; shake occasionally until the froth becomes white and the reaction is complete. Filter the solution into the warm syrup, and if necessary add sufficient of the Water to produce 20 oz.

Each fluid drachm contains about 4½ grains of Bromide of Iron.

**Dose.**—30 to 60 minims.

**SYRUPUS FERRI ET QUININÆ HYDROBROMATUM** (*B.P.C.*).—Acid Hydrobromate of Quinine, 160 grains; Diluted Hydrobromic Acid, 1 oz.; Distilled Water, 1 oz.: mix the Acid and Water and dissolve the Quinine Salt; then add Syrup of Bromide of Iron to make 20 oz.

1 fl. drm. = 1 grain Acid Hydrobromate of Quinine, and about 4 grains Bromide of Iron.

The acid solution must, however, be made warm, and if filtration is necessary, kept warm during the process, otherwise the salt will crystallise out (*see below*).

**Dose.**—30 to 60 minims.

**SYRUPUS FERRI, QUININÆ ET STRYCHNINÆ HYDROBROMATUM** (*B.P.C.*)—Strychnine in powder, 2½ grs.; Acid Hydrobromate of Quinine, 160 grs.; Diluted Hydrobromic Acid 1 oz.; Distilled Water 1 oz.: mix the Acid and Water, and in this dissolve the Strychnine and Quinine Salt by the aid of a gentle heat; then add Syrup of Bromide of Iron to make 20 oz.

In the case of this and the preceding formula, as we have previously pointed out, (*C.D.* '93, i. 422), there is too great an excess of Acid. The Acid Hydrobromate of Quinine is soluble 1 in 6 of cold Water, but its solubility is greatly reduced in presence of free Hydrobromic Acid. With the full *B.P.C.* quantity of Acid, the Syrup is very prone to crystallise; with half the quantity a slight separation takes place during very cold weather; with no Acid at all the Syrup is absolutely permanent, except for a slight precipitation of Ferric Hydrate. It is obvious, therefore, that the proportion of Acid in the *B.P.C.* formula should be greatly reduced—say to a fourth of the quantity now prescribed.

1 fl. drm. = $\frac{1}{64}$ grain Strychnine, 1 grain Acid Hydrobromate of Quinine and about 4 grains Bromide of Iron.

**Dose.**—30 to 60 minims.

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## FERRI CARBONAS SACCHARATA.

### SACCHARATED CARBONATE OF IRON.

Carbonate of Iron, $FeCO_3, xH_2O$ mixed with Peroxide of Iron and Sugar, the Carbonate (if reckoned as anhydrous) forming about one-third of the mixture.

Sulphate of Iron, 2; Carbonate of Ammonium, 1¼; Boiling Distilled Water, 320; Refined Sugar, 1: dissolve the Sulphate of Iron and the Carbonate of Ammonium, each separately in one-fourth of the Water, and mix thoroughly and briskly the two solutions in a deep cylindrical vessel, which is to be then covered closely; in twenty-four hours decant the supernatant liquid by a syphon, and pour the remainder of the Water on the precipitate, stir well, and again syphon off the liquid when clear. Collect the deposit on a calico filter, press, and rub with the Sugar in a porcelain mortar. Dry it at a temperature not exceeding 212° F. (100° C.).

When cold or tepid Water is used in the place of boiling Water, the precipitate occupies much less bulk, and is more easily washed. To avoid the formation of basic salts, the Iron should always be added to the Alkali.

The Sugar protects the Carbonate of Iron from oxidation.

Small coherent lumps of a grey-brown colour, with a sweet, very feeble, chalybeate taste.

Dissolves with effervescence in warm Diluted Hydrochloric Acid.

**Tests.**—Its solution in Hydrochloric Acid gives but a very slight precipitate with Chloride of Barium—indicating a trace only of Sulphate. 30 grains dissolved in excess of Phosphoric Acid, and diluted with water, continue to give a blue precipitate with Ferricyanide of Potassium, until at least 287·5 grain-measures of the volumetric solution of Bichromate of Potassium have been added; that is to say, it must contain sufficient Ferrous Salt to require this quantity of Bichromate of Potassium to convert it all into Ferric Salt.

Phosphoric Acid is used here in the place of Hydrochloric Acid, on the theory that the latter caused inversion of Sugar and consequent reduction of the Bichromate. It has lately been shown (*P.J.* xxii. 805) that cold Phosphoric Acid gives a result 2½ per cent. lower than warm Phosphoric Acid, although in the latter case there was no inversion of Sugar, also that cold Hydrochloric Acid gives results identical with hot Phosphoric Acid. It will, therefore, be necessary to specify in next B.P. at what temperature the Phosphoric Acid is to be used.

(Ferrum Carbonicum Saccharatum, Austr. contains about 40 p. c. of Carbonate of Iron, and Swiss 20 p. c.; Belg. Carbonas Ferri Saccharatus, 20 p. c.; U.S. contains 15 p. c.; Ger. and Russ., 9·5 to 10 p. c. of Iron equal to about 20 p. c. of Carbonate; Dan. and Swed. Hydratocarbonas Ferrosus Saccharatus; not in the others.)

**Medicinal Properties.**—An excellent chalybeate; readily soluble in acids. Not astringent. Useful in anæmic amenorrhœa.

**B.P.Dose.**—5 to 30 grs., which is equivalent to 1⅔ to 10 grs. of Carbonate of Iron.

**Incompatibles.**—Acids and Acidulous Salts; all Vegetable Astringents.

## Preparations.

**MISTURA FERRI COMPOSITA.** *N.O.Syn.*—Griffiths' Mixture.

Sulphate of Iron, 25 grs.; Carbonate of Potassium, 30 grs.; Myrrh, 60 grs.; Sugar, 60 grs.; Spirit of Nutmeg, 4 drms.; Rose Water, 9½ oz.

Reduce the Myrrh to powder, add the Carbonate of Potassium and Sugar, and triturate them with a small quantity of Rose Water so as to form a thin paste, then gradually add more Rose Water and the Spirit of Nutmeg, continuing the trituration and further addition of Rose Water until about eight fluid ounces of a milky liquid is formed; then add the Sulphate of Iron previously dissolved in the remainder of the Rose Water, mix thoroughly, and preserve the mixture as much as possible from contact with air.

It is convenient to keep this mixture without the Iron; the addition of the Sulphate of Iron, as directed, can be made when required.

**Dose.**—1 to 2 oz. as a stimulating tonic.

(Dan. and Norw. similar to Brit., but with three times as much Sugar, and without Nutmeg; Swed., with Peppermint Water and Tincture of Lavender in the place of Rose Water and Nutmeg; U.S. similar to Brit., but with Sp. of Lavender in the place of Nutmeg; not in the others.)

### PILULA FERRI CARBONATIS.

Saccharated Carbonate of Iron, 4; Confection of Roses, 1: mix. =(1 in 1¼).

**B.P.Dose.**—5 to 20 grs. (usual dose prescribed 3 to 5 grs.), as a tonic for delicate females and children.

This resembles Vallet's mass, which is made by precipitating and washing the Carbonate of Iron, and mixing it with Honey and Sugar of Milk to form a mass.

Blaud's Pills are made by mixing in the pill mass the Sulphate of Iron and Carbonate of Potassium.

(Belg., Pilulæ Blaud and Pilulæ Vallet; Dan. and Dutch, Pilulæ Blaudii; Fr., Pilules de Carbonate Ferreux and Pilules Ferrugineuses de Blaud; Ger., Pilulæ Ferri Carbonici; Ital., Pilloe di Carbonato Ferroso (Pillole di Blaud) also (Pillole di Vallet); Port., Pilulas de Carbonato Ferroso; Span., Pildoras de Blaud and Pildoras Ferruginosas de Vallet; Swed., Pilulæ Myrrhæ Ferratæ; Swiss, Pilulæ Ferratæ Kalinæ (Pil Blaudii) and Pilulæ Ferri Carbonici (Pil Valleti); U.S., Pilulæ Ferri Carbonatis (Blaud's Pills), also Massa Ferri Carbonatis (Vallet's Mass); not in the other Pharmacopœias.)

### PILULA FERRI.

Sulphate of Iron, 60 grains; Carbonate of Potassium, 36 grains; Sugar, 12 grains; Tragacanth, 4 grains; Glycerine, 2½ minims. Distilled Water, a sufficiency. Reduce the Sulphate of Iron to fine powder in a mortar, add the Sugar and Tragacanth and mix intimately; finely powder the Carbonate of Potassium in another mortar and thoroughly incorporate with it the Glycerine. Transfer this to the mortar containing the Sulphate of Iron, beat thoroughly until the mass becomes green and add Water, if necessary, sufficient to impart a pilular consistence, and divide into five-grain pills.

Each pill contains about 1 grain of Ferrous Carbonate, and is commonly known as "Blaud's Pill."

**Dose.**—1 to 3 pills.

As the French Codex orders equal parts of the *dried* salts, the proportions are somewhat similar to the above.

#### Not Official.

**TROCHISCI FERRI CARBONATIS SACCHARATÆ.**—These are now largely used, containing 3 grains of Saccharated Carbonate in each.

**Dose.**—1 to 3 lozenges.

## FERRI ET AMMONII CITRAS.

### CITRATE OF IRON AND AMMONIUM.

In thin transparent scales of a deep red colour, slightly sweet and astringent in taste; prepared by dissolving Ferric Hydrate in Citric Acid, adding a slight excess of Ammonia, evaporating and scaling.

**Solubility.**—10 in 5 of water; 2 dissolved in 3 of water measure 4; almost insoluble in Rectified Spirit.

**Tests.**—Heated with Solution of Potash, it evolves Ammonia and deposits Ferric Hydrate; the alkaline solution from which the Iron has separated does not, when slightly supersaturated with Acetic Acid, give any crystalline deposit—absence of Tartaric Acid. When incinerated with exposure to air, it leaves about 30 per cent. of Peroxide of Iron, which is not alkaline to Litmus.

In commercial samples the ash is always alkaline, owing to fixed alkali being used for the precipitation of the Iron; as in the case of Ferrum Tartaratum, some Magnetic Oxide ($Fe_3O_4$) is also formed during the ignition.

Of seven commercial samples examined (*P.J.* xviii. 425 and 777), four contained 30 per cent. of ash, and the others 33, 38, 43 per cent.; only one of the seven was free from Tartaric Acid.

It has been pointed out (*P.J.* xx. 246) that commercial samples frequently contain Sulphuric Acid, presumably from basic Sulphate of Iron precipitated with the Hydrate, also that part of the Iron was reduced to the ferrous condition.

(U.S.; Austr. and Swiss, Ferrum Citricum Ammoniatum; Belg., Citras Ferri; Fr., Citrate de Fer Ammoniacal; Norw., Citras Ferrico-Ammonicus; Port., Citrato de Ferro Ammoniacal; Russ. and Swiss, Ferrum Citricum Oxydatum Ammoniatum; Span., Citrato Ferrico-Amonico; not in the others. Ger. has Ferrum Citricum Oxydatum; Ital., Citrato di Ferro.)

**Medicinal Properties.**—As a hæmatinic, it is a very effectual salt, and it possesses scarcely any astringency: it may often be given when the stomach will not bear the more astringent preparations of Iron.

**Dose.**—5 to 10 grs.; it becomes moist if kept in paper.

**An Aqueous Solution** may be made and kept for dispensing, 2 fl. oz. representing 1 oz. of the scale preparation; it is quite permanent.

In prescribing the above salt to be taken during effervescence, care must be taken to put the salt of Iron into the Citric Acid Solution, and not into the Bicarbonate of Potassium Solution, because if it be put into the latter, Carbonic Acid will be given off and the bottle burst. Tincture of Orange is the best flavouring agent, but prescribers are in the habit of ordering this salt in Tincture of Orange alone, in which it will not dissolve, therefore the division into doses is impracticable. The addition of only a small quantity of water will make the solution perfect.

**Incompatibles.**—Mineral Acids, Vegetable Astringents, and fixed Alkalies.

### Preparation.

**VINUM FERRI CITRATIS.**

Citrate of Iron and Ammonium, 160 grs.; Orange Wine, 20 oz.; dissolve, and after three days filter. =(1 gr. in each fl. drm.).

**Dose.**—1 to 4 drms.

(U.S., Tincture of Orange, Syrup, and stronger White Wine, 1 in 25; Fr. (Vin Chalibé), 1 and 200 of Malaga; not in the other Pharmacopœias.)

## FERRI ET QUININÆ CITRAS.

### CITRATE OF IRON AND QUININE.

Thin scales of a greenish golden-yellow colour, somewhat deliquescent, entirely soluble in cold Water.

In the Official process a solution of Citrate of Iron is formed by precipitating Ferric Hydrate from Liquor Ferri Persulphatis with Ammonia, washing and dissolving in Citric Acid; Quinine Hydrate is prepared by precipitating a solution of the Sulphate in Sulphuric Acid with slight excess of Ammonia; this precipitate is dissolved in the solution of Citrate of Iron, Ammonia is added (not in excess), and the resulting solution evaporated and scaled.

It is stated (*Y.B.P.* '78, 80), that on a manufacturing scale the precipitated Ferric Hydrate contains so much basic Sulphate, as completely to outweigh the small proportion (1·6 per cent.) of Sulphuric Acid, which would be introduced by substituting Sulphate of Quinine for the precipitated alkaloid, and that, therefore, the separation of the alkaloid may be omitted in the process.

**Solubility.**—2 in 1 of Water.

Taste bitter as well as chalybeate.

**Tests.**—Its aqueous solution is very slightly acid, and is precipitated reddish-brown by Solution of Soda, blue by Ferro- and Ferri-cyanide of Potassium, and greyish-black by Tannic Acid. When burned with exposure to air, it leaves a residue (Oxide of Iron) which, when moistened with water, is not alkaline to test-paper. 50 grains dissolved in an ounce of Water, and treated with a slight excess of Ammonia, give a white precipitate, which, when dissolved out by successive treatments of the fluid with Ether or Chloroform, the latter evaporated, and the residue dried until it ceases to lose weight, weighs 7½* grains (Quinine); the precipitate is almost entirely soluble in a little Pure Ether.

According to Allen, the scales may be expected to contain 8 per cent. of Water, but not more than 12 per cent. The Ferric Oxide left on ignition should be 18 to 20 per cent. In shaking out with Chloroform or Ether a *considerable* excess of Ammonia should be present, and the volume of solvent should equal that of the ammoniacal liquid. The alkaloidal residue should be dried at 110—120° C., a constant weight being difficult to obtain at water-bath temperature.

(Austr., Ger. and Russ., Chininum Ferro-Citricum; Port., Citrato de Ferro et de Quinina; Span., Citrato Ferrico-Quinico; Swed., Citras Ferrico-Chinicus; Swiss, Chinino-Ferrum Citricum; U.S.; not in the others.)

**Medicinal Properties.**—Astringent and tonic, combining the properties of both Iron and Quinine.

6⅔ grains contain 1 grain of Quinine.

**Dose.**—5 to 10 grains as a tonic, three times a day, in **solution**; or in **pill** made with Rectified Spirit.

For dispensing purposes, an aqueous **solution**, 2 fl. oz. = 1 oz. scales, keeps well.

**Incompatibles.**—Alkalies and their Carbonates, Tannic Acid, and Vegetable Astringents.

### Not Official.

**MISTURA FERRI ET QUINIÆ EFFERVESCENS.**—Citrate of Iron and Ammonia, 5 grs.; Sulphate of Quinia, 1 gr.; Citric Acid, 10 grs.; Water, 1 oz., to be taken with 10 grs. of Bicarbonate of Soda.—*Consumption Hospital.*

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* B.P. 1867 and the first issue of B.P. 1885 required 8 grains, but it has since been altered by the editors of B.P. to 7½.

Not Official.

## FERRI HYPOPHOSPHIS.

There are two Hypophosphites of Iron, the Ferrous or Protosalt which is the basis of all the *B.P.C.* preparations, and the Ferric or Persalt used in most of the American and other proprietary Syrups of the Hypophosphites.

**FERROUS HYPOPHOSPHITE** when freshly prepared is a greenish crystalline powder, soluble about 1 in 10 of Water, but the commercial Salts are so insoluble as to be practically useless for Pharmaceutical purposes.

**FERRI HYPOPHOSPHITIS LIQUOR FORTIS** (*B.P.C.*).—Sulphate of Iron, 760 grs.; Hypophosphite of Barium (containing not less than 95 p. c. of $Ba.2(PH_2O_2)\ H_2O$), 830 grs.; Diluted Sulphuric Acid 100 mins.; Distilled Water, 20 oz.: put the Sulphate of Iron with 5 oz. of the Water in a tall 24-oz. bottle and shake till dissolved. Dissolve the Hypophosphite of Barium in the remainder of the Water, 15 oz., and add slowly to the former solution: shake and add the Diluted Sulphuric Acid, again shake and set aside for two days, then syphon off the clear liquid. Keep it in bottles quite full and in a dark place.

Each fl. drm. = about 5 grs. of Hypophosphite of Iron.

The Solution has an acid reaction, and it should not give more than a faint precipitate, if any, with either Diluted Sulphuric Acid or solution of Chloride of Barium.

**Dose.**—10 to 30 minims.

In Churchill's original formula for the Compound Solution, the Hypophosphite of Iron was prepared by double decomposition between Hypophosphite of Lime and Sulphate of Iron. This was improved upon (*B.P.C.* '87) by dissolving precipitated Ferrous Carbonate in Hypophosphorous Acid, and afterwards (*B.P.C.* '88) exchanged for the Barium method described above; but the solution is readily made (as described by Everson, *P.J.* xviii. 517), and without the use of Barium Salts which are always objectionable, by dissolving with the aid of heat, 153 grs. of Iron Wire in 3 oz. of Hypophosphorous Acid, with sufficient Water to make at the finish 20 oz. The product having been filtered through Cotton Wool, it will contain 5 grs. per drm. of the Hydrated Salt ($FeP_2H_4O_4.6H_2O$), to which all the *B.P.C.* formulas are calculated.

**LIQUOR HYPOPHOSPHITUM COMPOSITUS** (*B.P.C.*).—Hypophosphite of Calcium, 320 grs.; Hypophosphite of Sodium, 320 grs.; Hypophosphite of Magnesium, 160 grs.; Strong Solution of Hypophosphite of Iron, 6 oz.; Hypophosphorous Acid (30 p. c.), ½ oz.; Distilled Water, a sufficiency. Dissolve the Hypophosphites of Calcium, Sodium, and Magnesium in 12 oz. of the Water; add the solution of Hypophosphite of Iron and the Hypophosphorous Acid. Filter, and add Distilled Water to make 20 oz.

Each fl. drm. = 2 grs. each of Hypophosphite of Sodium and Calcium, 1 gr. Hypophosphite of Magnesium, and 1½ grs. of Hypophosphite of Iron.

**Dose.**—½ to 2 drachms.

**SYRUPUS FERRI HYPOPHOSPHITIS** (*B.P.C.*).—Strong Solution of Hypophosphite of Iron, 4 oz.; Syrup, 16 oz.: mix.

Each fl. drm. = about 1 gr. of Hypophosphite of Iron.

**Dose.**—½ to 2 drachms.

**SYRUPUS HYPOPHOSPHITUM COMPOSITUS** (*B.P.C.*).—Quinine (alkaloid), 20 grs.; Strychnine, 1 gr.; Hypophosphorous Acid (30 p.c.), 2 drms.; Strong Solution of Hypophosphite of Iron, 3 oz.: dissolve and add Hypophosphite of Calcium, 80 grs.; Hypophosphite of Manganese, 40 grs.; Hypophosphite of Potassium, 40 grs.: dissolve, filter, and add Syrup to produce 20 oz.: mix.

All these Syrups oxidise on exposure to air with precipitation of Ferric Hypophosphite. It is stated (*Y.B.P.* '90, 501) that this may be prevented to a great extent by addition of a small quantity ($\frac{1}{4}$ gr. per oz.) of Citric Acid; but in our experience even larger proportions are of little or no use.

Each fl. drm. contains $\frac{1}{160}$ gr. Strychnine and $\frac{1}{8}$ gr. of Quinine.

**Dose.**—$\frac{1}{2}$ to 2 fluid drachms.

**FERRIC HYPOPHOSPHITE.**—This compound is obtained as a white precipitate on adding a solution of a soluble Hypophosphite to one of Ferric Chloride containing as little free Acid as possible.

It is fairly insoluble in Water, but with the addition of Citrate of Potassium it dissolves readily to a green solution which forms with Sugar a pale yellow *neutral* Syrup absolutely permanent and unalterable by exposure to air, which may be combined with other soluble Hypophosphites, Quinine Hydrochlorate, and Strychnine without the addition of Acid, and is free from all the pharmaceutical objections attaching to Hypophosphite Syrups containing Iron in the ferrous condition.

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Not Official.

## FERRI IODIDUM.

IODIDE OF IRON.

$FeI_2.2H_2O$.

In reddish-brown dense masses, easily soluble in Water, with a slight residue, and forming a reddish-yellow solution owing to partial oxidation. The solution may be made green by either hot or cold digestion over bright Iron Wire.

It was official in B.P. 1864 and 1867, but is now omitted in B.P. 1885. The official preparations Pilula and Syrupus are still retained.

A volumetric process (with Perchloride of Mercury) for estimating Iodide of Iron in either purely aqueous or saccharine solution is given *P.J.* xxii. 268.

(Belg., Port., Span. and Swiss; not in the others.)

**LIQUOR FERRI IODIDI FORTIS.**—A clear greenish liquid. Sp. g. 1·511.

Each fl. drm. contains 34 grs. of Iodide of Iron ($FeI_2 = 310$).

The solution keeps well in a corked bottle, with bright Iron Wire immersed in it, and on filtration gives a clear green liquid. A small quantity of Hypophosphorous Acid is now commonly used for the same purpose; with this addition the Liquor will keep well, and may be exposed to the air without depositing.

(Ger. (Liquor Ferri Iodati) and Russ. (Ferrum Iodatum Solutum), containing 50 p. c. of Iodide of Iron.)

**LIQUOR FERRI IODIDI.**—Strong Solution of Iodide of Iron, 1; Distilled Water, 7; mix. This solution is the same strength as the Syrup of Iodide of Iron.

**FERRI IODIDUM SACCHARATUM.**—U.S.; a solution of Iodide of Iron dried down with Sugar of Milk; 5 parts contain 1 of Iodide.

**Incompatibles.**—Acids, Acidulous Salts, Alkalies and their Carbonates, Lime Water, Vegetable Astringents.

### Official Preparations.

**PILULA FERRI IODIDI.** *N.O.Syn.*—BLANCHARD'S PILLS.

Fine Iron Wire, 40 grs.; Iodine, 80 grs.; Refined Sugar in powder, 70 grs.; Liquorice Root in powder, 140 grs.; Distilled Water, 50 minims: agitate the Iron with the Iodine and the Water in a strong stoppered ounce phial, until the froth becomes white. Pour the fluid upon the Sugar in a mortar, triturate briskly, and gradually add the Liquorice.

Both in this Pill and in the following Syrup, half the quantity of Iron is sufficient for the purpose, and a coarser guage than No. 32 is advisable.

$3\frac{1}{2}$ grains contain 1 grain of the anhydrous Iodide.

**Dose.**—3 to 8 grs.

(Belg., Dan., Dutch, Fr., Ital., Norw., Port., Span., Swed., and Swiss, each pill contains about $\frac{3}{4}$ grain Iodide of Iron, Hung. and U.S. about 1 grain, and all coated with Bals. Tolu dissolved in Ether, except the Swiss; not in the others.)

## SYRUPUS FERRI IODIDI.

Iron, 1; Iodine, 2; Refined Sugar, 28; Distilled Water, 13. Make a syrup with the Sugar and 10 of the Water, and keep it hot. Digest the Iron, the Iodine, and 3 of Water, in a flask at a gentle heat, shake them together until the froth of the mixture becomes white; add now 2 of the syrup, and boil gently for ten minutes; filter whilst still hot into the remainder of the syrup, and mix. The product should weigh about 43, or measure $31\frac{1}{2}$.

Sp. g. 1·385.

This Syrup is very liable to become discoloured. It may be due to one or other of two causes. (1.) Oxidation of Iron, which may be prevented by careful manipulation or removed by Hypophosphorus Acid. (2.) Slight caramelisation of the Sugar by overheating; this cannot be removed by reducing agents, and is best avoided by heating the Syrup in a water-bath for two hours, in place of boiling it as in the Official process.

Each fluid drachm contains 4·3 grains of the anhydrous Iodide.

(Brit. 5·7 p. c. of Iodide of Iron; Austr., Dutch, Ger., and Russ., 5 p. c.; Belg., Fr., Ital. and Port., 0·5 p. c.; Dan., Norw., Swed. and U.S., 10 p. c.; Hung., 12 p. c.; Span., ·67 p. c.; Swiss, 1 p. c.; all by weight.)

**Medicinal Properties.**—It combines the properties both of Iodine and Iron, and is a most valuable tonic in the treatment of scrofulous diseases in cachectic subjects requiring Iron.

**Dose.**—20 to 60 minims.

Not Official.

## FERRI LACTAS.

$Fe(C_3H_5O_3)_2.3H_2O$, eq. 288.

Small greenish crystals, with a tendency to oxidise on exposure to air.

**Solubility.**—1 in 300 of Water.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Given in anæmia and chlorosis.

**Dose.**—2 to 10 grains given in lozenge, pill, or syrup.

Not Official.

## FERRI PERCHLORIDUM.

The Anhydrous Chloride of Iron ($Fe_2Cl_6$), prepared by sublimation, is in black metallic-looking plates. It deliquesces rapidly on exposure to the air, and then solidifies again to a Hydrate ($Fe_2Cl_6.12H_2O$), containing 40 per cent. of Water.

Another Hydrate ($Fe_2Cl_6.5H_2O$), containing 21·7 per cent. of Water (Official in the Portuguese Pharmacopœia), can be obtained by evaporating an acid solution until syrupy, and then cooling it.

The commercial solid or crystalline Perchloride of Iron approximates to the formula $Fe_2Cl_6.12H_2O$; it occurs in yellow or yellowish-brown crystalline masses, deliquescing in air. It is soluble in Water, Alcohol, Ether, and Glycerine.

(Austr., Ger. and Hung., Ferrum Sesquichloratum Crystallisatum; Belg., Chloruretum Ferricum Anhydricum; Dan., Dutch, Norw., and Swed., Chloretum Ferricum; Port., Chloreto Ferrico Anhydro, also Crystallisado; Russ., Ferrum Sesquichloratum; Span., Chloruro Ferrico (anhydrous and the Hydrate); U.S., Ferri Chloridum; not in Fr., Ital. or Swiss.)

## FERRI PERCHLORIDI LIQUOR FORTIOR.

### STRONGER SOLUTION OF PERCHLORIDE OF IRON.

Perchloride of Iron, $Fe_2Cl_6$, eq. 325, in solution in water.

Iron Wire, 4; Hydrochloric Acid, 20½; Nitric Acid, 1½; Distilled Water, a sufficiency. Mix 12½ of the Hydrochloric Acid with 7 of the Water, and pour the mixture on the Iron Wire placed in a flask, applying a gentle heat until effervescence ceases; boil, then filter the solution from undissolved Iron, rinsing the flask and contents with a little Water and pouring this over the filter; and add to the filtrate 7 of Hydrochloric Acid; mix, and pour the solution in a slow continuous stream into 1½ of Nitric Acid, the evolution of red fumes being promoted if necessary by a slight application of heat. Evaporate the product until no more nitrous fumes escape and a precipitate begins to form; then add 1 of Hydrochloric Acid and sufficient Water to produce 17½ of the solution.

Note.—This solution is now improved by being evaporated much lower, as suggested in previous editions of the Companion; but as the sp. g. varies with the point to which the evaporation is carried, it should be evaporated to a given weight, say 12½ ounces.

An orange-brown solution, miscible with Water and Alcohol in all proportions. It contains 20 per cent. of Iron.

**Tests.**—Sp. g. about 1·42.—A fluid drachm diluted with 2 ounces of Water gives, upon the addition of an excess of Solution of Ammonia, a reddish-brown precipitate, which, when well washed and incinerated, weighs between 15 and 16 grains. Diluted with Water it gives a white precipitate with Nitrate of Silver (Chloride), and blue with Ferrocyanide of Potassium (Ferric Salt), but none with Ferricyanide of Potassium (absence of Ferrous Salt). A piece of Copper, boiled for a few minutes in 50 or 100 grains of this solution diluted with Water, then rinsed with Water, dried and heated in a dry test-tube, yields no white crystalline sublimate.

(Austr., sp. g. 1·280; Belg., Fr., Port. and Span., sp. g. 1·260 (about 9 p. c. of Iron); Dan., Norw. and Swed., sp. g. 1·298—1·302, Swiss, sp. g. 1·280—1·290 (about 10 p. c. of Iron); Dutch, 1·441—1·488 (about 15 p. c. of Iron); Ger., Hung. and Russ., sp. g. 1·280—1·282 (10 p. c. of Iron); Ital., sp. g. 1·469—1·480; U.S., sp. g. 1·387.)

**Medicinal Properties.**—A powerful local styptic and astringent. Mixed with equal parts of Glycerine has been used as a **paint** in diphtheria. The more dilute forms are used internally.

## Preparations.

### LIQUOR FERRI PERCHLORIDI.

Solution of Perchloride of Iron. Of the same strength as the Tincture.

Strong Solution of Perchloride of Iron, 1; Distilled Water, sufficient to produce, after admixture, 4. =(1 in 4).

Sp. g. 1·11.

**Dose.**—10 to 30 minims.

This preparation was introduced in order to save the expense of the Spirit used in the Tincture; also it kept better than the former Tincture.

### TINCTURA FERRI PERCHLORIDI. *N.O.Syn.* — STEEL DROPS. TINCTURE OF STEEL.

Strong Solution of Perchloride of Iron, 1; Rectified Spirit, 1; Distilled Water, 2: mix, and then add sufficient Distilled Water to make 4. =(1 in 4).

Sp. g. 1·080—1·083.

(Dan., Norw. and Swed., Solutio Chloreti Ferrici Spirituosa; Ger., Tinct. Ferri Chlorati Ætherea; U.S., Tinctura Ferri Chloridi; Belg., Port. and Russ., from the Salt, with Alcohol and Ether; Ital. (Soluzione Alcoolico-Eterea di Cloruro Ferrico), from the Solution with Alcohol and Ether; not in the others.)

**Medicinal Properties.**—The Tincture and Solution of Perchloride of Iron have been more used than any other preparation of Iron; given in passive hæmorrhage and as a general tonic; highly useful in anæmia, chlorosis, and epilepsy; used as a paint in erysipelas; act especially on the kidneys in albuminuria, the urethra in gleet, and give tonicity to the bladder; slightly aphrodisiac.

It has been given with success in acute Rheumatism.—*B.M.J.* '75, ii. 417; '76, i. 563.

**Dose.**—10 to 30 minims in Water.

When given during effervescence, 9 grains of Bicarbonate of Sodium are about equal to 60 minims of Tincture.

**Tinctura Ferri Sesquichloridi P.L.—Tinctura Ferri Muriatis P.E.**—There is an idea which periodically finds its way into print, that a Tincture made according to the formula of the London and Edinburgh Pharmacopœias is more efficacious than the B.P. and can be given in cases where the other is not tolerated. From a chemical point of view the only difference is that P.L. is three-fourths the strength of B.P., and when freshly made contains one-fifteenth of the Iron in the Ferrous condition. Alcohol has no reducing action on Ferric Chloride even after years of contact.

**Incompatibles.**—Alkalies and their Carbonates, Lime Water, Carbonate of Calcium, Magnesia and its Carbonate, Mucilage of Acacia.

Preparations of Iron can be given in Infusion of Quassia, or Calumba, but they tinge Infusion of Chiretta and Hops, and change to brown or black those of Chamomile, Cusparia, Gentian, Orange, Cascarilla, Cloves, Digitalis, Bark, and all astringent infusions.

### LIQUOR FERRI DIALYSATUS.

Mix Strong Solution of Perchloride of Iron 6, with Distilled Water 40, and stir into the mixture sufficient diluted Solution of Ammonia to impart, after thorough agitation, a distinct ammoniacal odour. Collect the precipitated Ferric Hydrate on calico and wash it with Distilled Water, then squeeze to remove the superfluous water: add the precipitate to Strong Solution of Perchloride of Iron 1, stir thoroughly, warm gently, and when complete or nearly complete solution is obtained, filter, if necessary, and place the liquid in a covered dialyser; then subject it to a stream of water in the usual manner until the solution on the dialyser is almost tasteless. The resulting solution should measure 28.

This Solution of Dialysed Iron, so called, is a solution of highly basic Ferric Oxychloride, or Chloroxide of Iron, from which most of the acidulous matter has been removed by dialysis.

Instead of dialysing until the solution is nearly tasteless, which is a very indefinite point, it would be better to work to a definite percentage of Chlorine; it may be reduced to ·3 per cent. without interfering with the stability of the solution. It is very doubtful, however, whether there is any advantage in reducing the Chlorine ratio below that of Liquor Ferri Chloroxydi as described below.

Another method is to add a certain proportion of diluted Ammonia to a solution of Ferric Chloride, so that the precipitate which first forms just re-dissolves. The Ammonia becomes Ammonium Chloride and the Iron a very basic Oxychloride, from which the Ammonium Salt is readily dialysed. Where a saving of expense is an object, as in some large institutions, it would probably be equally efficacious without dialysis.

A clear dark reddish-brown liquid, free from any marked ferruginous taste. Neutral to test-papers.

Sp. g. about 1·047.

**Tests.**—The solution gives no precipitate with Ferrocyanide of Potassium or with Nitrate of Silver, but after being heated with Hydrochloric Acid it yields with Ferrocyanide of Potassium a blue precipitate. 100 grains by weight affords a precipitate with a Solution of Ammonia, which washed, dried, and ignited, weighs 5 grains.

The addition of Ferrocyanide of Potassium may be expected to throw out the Ferric Hydrate, tinged with a little Prussian Blue.

(Austr., Ferrum Hydro-oxydatum Dialysatum Liquidum; Ger., Hung., and Russ., when Liquor Ferri Oxydati Dialysati is prescribed, Liquor Ferri Oxychlorati (sp. g. 1·050) may be dispensed; Swiss, Ferrum Oxychloratum Solution, sp. g. 1·05; not in the others.)

**Medicinal Properties.**—A palatable non-astringent hæmatinic, given in cases where the astringent salts would derange the stomach.

**Dose.**—10 to 30 minims.

Not Official.

**LIQUOR FERRI CHLOROXYDI.**—A solution in Water of a basic Chloride of Iron, containing ·8 per cent. of Chlorine for 5 per cent. of Ferric Oxide, approximating to the formula $Fe_2Cl_6.7Fe_2O_3$. This is the ratio of the Solution made by us many years previous to the use of "Dialysed Iron." It was and is still made to contain 7·1 per cent. of Ferric Oxide to correspond with the Official Tincture.

**Dose.**—10 to 30 minims.

**TINCTURA FERRI CHLORATI ÆTHEREA** (Ger.). Liquor (sp. g. 1·280), 1; Ether, 2; Spirit, 7; all by weight.

## FERRI PERNITRATIS LIQUOR.

SOLUTION OF PERNITRATE OF IRON.

Pernitrate of Iron, $Fe_2 6NO_3$, eq. 484, in solution in Water.

Fine Iron Wire, 1; Nitric Acid, 4½; Distilled Water, *q. s.*: dilute the Nitric Acid with 16 of water, dissolve the Iron (taking care to moderate the action by occasionally adding more Water), filter, and add water to make the measure 30.

An Iron Wire of 35 gauge (or finer) as specified in B.P. 1885, both for this preparation and the Pill of Iodide of Iron, is most objectionable. The reaction is so rapid and violent that the liquid is almost certain to froth over, unless a coarser wire be used or the liquid externally cooled. In any case it is better to add the whole of the Water (25 parts) to the Acid before pouring it upon the Iron.

A clear solution, of a reddish-brown colour.

**Tests.**—Sp. g. 1·107 (more correctly 1·113 to 1·115). 1 fluid drachm treated with an excess of Solution of Ammonia gives a precipitate which, when washed, dried, and incinerated, weighs 2·6 grains. It gives no precipitate with Ferricyanide of Potassium—indicating absence of Ferrous Salt. When to a little of it placed in a test-tube half its volume of pure Sulphuric Acid is added, and then a solution of Sulphate of Iron is poured on, the whole assumes a dark-brown colour. (Test for Nitrate.)

(U.S., Liquor Ferri Nitratis, half the strength, sp. g. 1·050; not in the others.)

**Medicinal Properties.**—Tonic and astringent. Useful in chronic diarrhœa.

**Dose.**—10 to 40 minims.

## FERRI PEROXIDUM HYDRATUM.

PEROXIDE OF IRON.

*B.P. Syn.*—Ferri Sesquioxidum; Ferri Oxidum Rubrum.

$Fe_2O_3,H_2O$, eq. 178.

A reddish-brown powder, without taste, and not magnetic.

Moist Peroxide of Iron, obtained by precipitating a solution of the Persulphate of Iron with Solution of Soda, dried at 212° F. (100° C.), and reduced to powder.

**Solubility.**—Dissolves completely though slowly with the aid of heat, in Hydrochloric Acid, diluted with half its volume of Water.

**Tests.**—Heated to dull redness in a test tube it yields about 10 per cent. of moisture—indicating that it has not been dried at too high a temperature. The solution in Hydrochloric Acid gives a copious precipitate with the Ferrocyanide, but none with Ferricyanide of Potassium—indicating absence of Ferrous Oxide.

**Dose.**—5 to 30 grs.

(Belg., Carbonas Ferri; Fr., Oxyde de Fer Bihydraté; Ital., Ossido Ferrico Idrato; Norw. and Swed., Hydras Ferricus; Port., Oxydo Ferrico Carbonatado; Span., Hidrato Ferrico Gelatinoso; Swiss, Ferrum Oxydatum; U.S., Ferri Oxidum Hydratum.)

### Preparation.

**EMPLASTRUM FERRI.** *B.P.Syn.*—CHALYBEATE PLASTER. *N.O.Syn.*—EMPLASTRUM THURIS; EMPLASTRUM ROBORANS.

Peroxide of Iron, in fine powder, 1; Burgundy Pitch, 2; Lead Plaster, 8: melt the Pitch and Plaster together, and stir in the Oxide. =(1 in 11).

(U.S., similar; Fr., Emplâtre de Canet, about 1 in 5; Port., Emplastro de Oxydo Ferrico, 1 in 20; not in the others.)

Used as a strengthening plaster, and to afford mechanical support to relaxed muscles.

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## FERRI PHOSPHAS.

### PHOSPHATE OF IRON.

Ferrous Phosphate $Fe_3(PO_4)_2\ 8H_2O$, eq. 502, at least 47 per cent.; with Ferric Phosphate and some Oxide.

A slate-blue amorphous powder prepared by precipitating a solution of Sulphate of Iron with Phosphate and Bicarbonate of Sodium. Becomes of a green hue by keeping.

**Solubility.**—Insoluble in Water, but soluble in Acids.

**Tests.**—The solution in Hydrochloric Acid yields a precipitate with both the Ferrocyanide and Ferricyanide of Potassium—that afforded by the latter being more abundant; and when treated with Tartaric Acid and an excess of Ammonia, and subsequently with the Solution of Ammonio-Sulphate of Magnesium, lets fall a crystalline precipitate. When it is digested in Hydrochloric Acid with a lamina of pure Copper, a dark deposit does not form on the metal — indicating absence of Arsenic, and distinguishing it from the Arseniate of Iron. 30 grains dissolved in Hydrochloric Acid continues to give a blue precipitate with Ferricyanide of Potassium until 279 grain-measures of volumetric Solution of Bichromate of Potassium have been added—indicating nearly 47 per cent. of Ferrous Phosphate.

(Belg., Span. and U.S.; not in the others.)

**Medicinal Properties.**—Tonic. Possesses the general properties of the ferruginous preparations. Given with advantage in amenorrhœa, some forms of dyspepsia and rachitis.

**Dose.**—5 to 10 grs.

### Preparation.

**SYRUPUS FERRI PHOSPHATIS.**

Granulated Sulphate of Iron, 224 grs.; Phosphate of Sodium, 200 grs.; Bicarbonate of Sodium, 56 grs.; Concentrated Phosphoric Acid, $1\frac{1}{4}$ oz.; Refined Sugar, 8 oz.; Distilled Water, 8 oz. Dissolve the Sulphate of Iron in 4 oz. of boiling Water, and the Phosphate of Sodium in 4 oz. of cold Water: mix the two solutions, then add the Bicarbonate of Sodium dissolved in a little Water, and, after carefully stirring, transfer the precipitate to a calico filter, and wash it with Distilled Water till the filtrate ceases to be affected by Chloride of Barium; mix the residue on the filter, in a mortar, with the Phosphoric Acid. As soon as the precipitate is dissolved, filter the solution, add

Water and the Sugar, and dissolve without heat. The product should measure exactly 12 oz. Sp. g. about 1·305.

Each fluid drachm contains about 1 grain of anhydrous Phosphate of Iron.

This syrup can be conveniently made by adding 1 volume of Liquor Ferri Phosphatis Fortis to 6 vols. of Simple Syrup and 1 vol. of Distilled Water.

As the proportion of Phosphoric Acid is far in excess of any possible requirements, the following comparison may be of use in fixing an improved ratio for 100 grammes of metallic Iron.

| | | | |
|---|---|---|---|
| 1. To form a tribasic Phosphate of Iron, $Fe_3P_2O_8$ . | 117 | grammes | $H_3PO_4$ |
| 2. To retain the Iron in solution either as Strong Liquor or as Syrup . . . . . . . | 418 | ,, | ,, |
| 3. Proportion recommended *P.J.* xix. 255 . . | 729 | ,, | ,, |
| 4. B.P. 1864 and 1867 . . . . . . . | 912 | ,, | ,, |
| 5. B.P. 1885 . . . . . . . . . . | 1,337 | ,, | ,, |

Ferrous Phosphate absorbs Oxygen with great rapidity on exposure to air, and requires such a large excess of Acid to keep it in solution, that in framing a formula for Syrupus Ferri Phosphatis a compromise must be made between liability to deposit on the one hand and acidity on the other. We think it is better to use a comparatively small excess, such, for instance, as No. 3, and keep the Syrup in small bottles lying down.

**Dose.**—1 drm.

(Not in the other Pharmacopœias.)

## Not Official.

**LIQUOR FERRI PHOSPHATIS FORTIS.**—Containing 8 grains per fluid drachm of the anhydrous Phosphate, is made by dissolving 360 grains of Iron Wire in Phosphoric Acid, with sufficient Water to make 12 ounces. The amount of Acid used may vary according to the acidity desired; if that of B.P. 1885, then 11 ounces must be used, *see* above.

**SYRUPUS FERRI PHOSPHATIS COMPOSITUS** (*B.P.C.*).—Iron Wire, free from oxide, 37½ grs.; Concentrated Phosphoric Acid (sp. g. 1·5), 1 oz.; Distilled Water, 5 drms.: dissolve by a gentle heat in a flask plugged with cotton-wool, the Iron being completely covered by the liquid.

Precipitated Carbonate of Calcium, 120 grs.; Concentrated Phosphoric Acid, 4 drms.; Distilled Water, 2 oz.: mix, and add Bicarbonate of Potassium, 9 grs.; Phosphate of Sodium, 9 grs.: filter and set aside.

Cochineal, 30 grs.; Distilled Water, 7½ oz.: boil for fifteen minutes and filter, pouring over the filter a sufficient quantity of Distilled Water to produce 7 oz. of filtrate; to this add Refined Sugar, 14 oz.: heat till dissolved and strain. When cold add the Iron and Calcium solutions and sufficient Distilled Water to produce 20 oz.

Each drm. = ½ grain Phosphate of Iron and ⅘ grain Phosphate of Calcium with small quantities of the Phosphates of Potassium and Sodium. It should be kept in bottles quite full.

**Dose.**—½ to 2 fluid drachms.

**SQUIRE'S CHEMICAL FOOD.**—The preparation made for many years by Parrish and imported by Squire, and subsequently purchased by Squire.

It contains Phosphate of Iron, Phosphate of Lime, Phosphate of Sodium, and Phosphate of Potassium.

**Dose.**—Half to one teaspoonful in water with meals.

A formula was published many years ago, but how far this has been a success is shewn by comparing the syrups commercially sold, all of them more or less emphatically stated to be made by the published formula.

In nine samples recently analysed, the Phosphate of Iron ranged from ·19 to ·66, the Phosphate of Lime from ·5 to 1·6, the total Phosphoric Acid from 1·5 to 4·7; these results are expressed in grains per fluid drachm.

**Medicinal Properties.**—A general tonic, specially indicated in scrofula and rickets.

As a tonic for pregnant women.—*L.M.R.* '88, 519.

**SYRUPUS FERRI PHOSPHATIS C. QUINIA ET STRYCHNIA.** (Dr. Easton's formula.)—"Sulphate of Iron, 300 grs.; Phosphate of Soda, 360 grs; Sulphate of Quinia, 192 grs.; Diluted Sulphuric Acid, a sufficiency; Solution of Ammonia, a sufficiency; Strychnia, 6 grs.; Diluted Phosphoric Acid, 14 oz.; White Sugar, 14 troy oz. Dissolve the Sulphate of Iron in 1 oz. boiling Water, and the Phosphate of Soda in 2 oz. boiling Water. Mix the solutions, and wash the precipitated Phosphate of Iron till the washings are tasteless. With sufficient Diluted Sulphuric Acid dissolve the Sulphate of Quinia in 2 oz. Water. Precipitate the Quinia with Ammonia Water, and carefully wash it. Dissolve the Phosphate of Iron and the Quinia thus obtained, as also the Strychnia, in the Diluted Phosphoric Acid; then add the Sugar and dissolve the whole, and mix without heat. The above Syrup contains about 1 gr. Phosphate of Iron, 1 gr. Phosphate of Quinia, and $\frac{1}{32}$ gr. of Phosphate of Strychnia in each fluid drachm. The dose might therefore be a teaspoonful three times a day."—*Aitkin. Science and Practice of Medicine*, 3rd ed. Vol. ii., p. 657.

The quantity of Phosphate of Soda is not sufficient to precipitate the whole of the Iron, and therefore this Syrup does not contain the full quantity.

In *C.D.* '93, i. 795, we have discussed in detail the history of this formula (originally published as above) and shewn how very indefinite must be the strength of any preparation made by it. On p. 422 of the same journal we have also discussed the influence of Acid upon the crystallising tendencies of the Syrup. Our opinion is that the conditions of cooling under which crystallisation will take place are very difficult to define, and owing to the readiness with which Acid Quinine Salts form supersaturated solutions, no evidence of non-crystallisation is conclusive unless the Syrup remains permanently liquid after the introduction of a nucleus of solid Acid Phosphate.

Tested in this way we find that, in a Syrup prepared with a minimum quantity, as well as with a very large excess of Phosphoric Acid, little if any crystallisation can be induced at 32° F., within twelve hours; the largest amount of crystallisation will take place just over the minimum quantity of Acid.

(U.S.; not in the other Pharmacopœias.)

**SYRUPUS FERRI, QUININÆ ET STRYCHNINÆ PHOSPHATUM** (*B.P.C.*).—Strychnine, in powder, 5 grs.; Concentrated Phosphoric Acid (sp.g. 1·5), 75 mins.; Distilled Water, 225 mins.: dissolve and add Phosphate of Quinine, 120 grs.: dissolve with a gentle heat and add Syrup of Phosphate of Iron sufficient to produce 20 oz.: mix thoroughly.

This syrup can be conveniently made by dissolving the Strychnine and Phosphate of Quinine (or an equivalent of Quinine alkaloid) in 2½ oz. of Liquor Ferri Phosphatis Fortis and diluting to 20 oz. with Simple Syrup.

Each fl. drm. = 1 grain Phosphate of Iron, ¾ grain Phosphate of Quinine, and $\frac{1}{32}$ grain of Strychnine.

**Dose.**—30 to 60 minims.

**SYRUPUS FERRI PHOSPHATIS C. MANGANESIO.**—Dissolve 100 grs. of Phosphate of Manganese in 1¼ oz. of Liquor Ferri Phosphatis Fortis and 30 mins. of Phosphoric Acid, then dilute to 20 oz. with Simple Syrup.

This Syrup will contain in each fluid drachm ½ grain each of Anhydrous Phosphate of Iron and Anhydrous Phosphate of Manganese, and represents the Syrup given under a different formula in former editions.

**Dose.**—1 drm.

This can sometimes be taken when Syrup of Phosphate of Iron disagrees.

# FERRI SULPHAS.

## SULPHATE OF IRON.

$FeSO_4.7H_2O$, eq. 278.

Pale bluish-green oblique rhombic prisms, with little or no efflorescence; may be prepared by saturating diluted Sulphuric Acid with Metallic Iron, evaporating and crystallising.

**Solubility.**—1 in 1½ of Water: the solution rapidly oxidizes on exposure; insoluble in Alcohol and Proof Spirit, hence it cannot be dissolved in Tinctures.

**Tests.**—The aqueous solution gives a white precipitate with Chloride of Barium (Sulphate), one nearly white with Ferrocyanide of Potassium, and a deep blue with Ferricyanide of Potassium (Ferrous Salt), but none with Sulphuretted Hydrogen. 42·1 grs. dissolved in Water acidulated with Sulphuric Acid continues to give a blue precipitate with Ferricyanide of Potassium until about 500 grain-measures of the volumetric solution of Bichromate of Potassium have been added (indicating about 99 per cent. of unoxidized Ferrous Sulphate).

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—A powerful astringent, but is apt to irritate the stomach. Internally it is given in anæmia; externally it is used as a **lotion**, 3 to 5 grs. in an oz. of Water.

**Dose.**—1 to 5 grs.

5 grains, with 3 grains of Sulphate of Quinine, has been given four or five times a day, for enlarged spleen.

Used in the preparation of Mist. Ferri Comp., Pil. Aloes et Ferri, and Pil. Ferri.

### Preparations.

**FERRI SULPHAS EXSICCATA.** $FeSO_4, H_2O$, eq. 170.

Sulphate of Iron exposed in a porcelain or iron dish to a temperature of 212° F. (100° C.) until aqueous vapour ceases to be given off; the loss in weight is about 40 per cent. Reduce to powder. Keep in stoppered bottles.

**Test.**—10 grains dissolved in Distilled Water acidulated with Sulphuric Acid continues to give a blue precipitate with Ferricyanide of Potassium, until at least 191 grain-measures of the volumetric solution of Bichromate of Potassium have been added, corresponding to at least 97½ per cent. of pure dried Sulphate of Iron.

Prescribed in pills. 2½ grains, which are equal to 4 of the crystallised salt, make a nice **pill** with a mixture of equal parts of Liquid Glucose and Treacle.

**Dose.**—½ to 3 grs.

(Belg.; Dan., dried at 104°—122° F.; Dutch; Ger. and Swiss, dried at 212° F.; Russ., dried at 77°—86° F.; U.S., dried at 300° F.; not in the others.)

**LIQUOR FERRI PERSULPHATIS.**

Sulphate of Iron, 8; Sulphuric Acid, $\frac{3}{4}$; Nitric Acid, $\frac{3}{4}$; Distilled Water, 12. Add the Sulphuric Acid to 10 of the Water, and dissolve the Sulphate of Iron in the mixture with the aid of heat. Mix the Nitric Acid with the remaining 2 of the Water, and add to this diluted acid warmed, the solution of Sulphate of Iron. Concentrate the whole by boiling, until, by the sudden disengagement of ruddy vapours, the liquid ceases to be black, and acquires a red colour. A drop of the solution is now to be tested, with Ferricyanide of Potassium, and if a blue precipitate forms, a few additional drops of Nitric Acid* should be added and the boiling renewed, in order that the whole may be converted into Persulphate of Iron. When the solution is cold, make up the quantity to 11 by the addition, if necessary, of Distilled Water.

Introduced for making several preparations of Iron.

**Tests.**—Sp. g. 1·441. Diluted with ten volumes of Water, it gives a white precipitate with Chloride of Barium, and a blue one with Ferrocyanide, but not with Ferricyanide of Potassium (absence of Ferrous Salt). 1 fl. dr. diluted with 2 oz. Distilled Water gives upon the addition of an excess of Solution of Ammonia a precipitate which when well washed and incinerated weighs 11·44 grs.

It must be noted that this is a calculated figure brought from B.P. 1864, in which no allowance is made for the 1 per cent. of impurity permitted by B.P. 1885.

This solution is a good styptic; it mixes in all proportions with Water and Rectified Spirit.

(Russ. and Swiss, sp. g. 1·428—1·430; U.S., sp. g. 1·320; not in the others.)

## FERRI SULPHAS GRANULATA.

### GRANULATED SULPHATE OF IRON.

$FeSO_4.7H_2O$, eq. 278.

Small granular crystals of a pale green colour, which are not so liable to become brown as those of the Ferri Sulphas.

Iron Wire, 4; Sulphuric Acid, 4; Distilled Water, 30; Rectified Spirit, 8. Pour the Water on the Iron placed in a porcelain capsule; add the Acid, and when the disengagement of gas has nearly ceased, boil for ten minutes; filter the solution into a jar containing the Spirit, stirring the mixture so that the salt shall separate in minute granular crystals. Pour off the liquid, and place the crystals on filtering-paper over porous bricks to dry by exposure to the atmosphere. Keep in stoppered bottles.

**Solubility.**—1 in $1\frac{1}{2}$ of Water; insoluble in Rectified Spirit.

**Tests.**—The aqueous solution gives no precipitate with Sulphuretted Hydrogen, and one nearly white with Ferrocyanide of Potassium. 41·7 grains dissolved in Distilled Water acidulated with

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* A small quantity of Sulphuric Acid will be found equally efficient.

Sulphuric Acid continues to give a blue precipitate with Ferricyanide of Potassium until 500 grain-measures of the volumetric solution of Bichromate of Potassium have been added.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Same as Ferri Sulphas.

**Dose.**—1 to 5 grs.

## FERRUM REDACTUM.

### REDUCED IRON.

Metallic Iron, with a variable amount of Oxide of Iron. A fine greyish-black powder, strongly attracted by the magnet, and exhibiting metallic streaks when rubbed with firm pressure in a mortar, Made by passing dry Hydrogen over Peroxide of Iron in a heated iron tube. It must be carefully preserved from the air.

In reference to the last sentence, it may be noted that under ordinary atmospheric conditions, a sample containing 91·5 per cent. of Iron, loosely covered with paper to keep out dust, lost only 1 per cent. in a month.

It dissolves in Hydrochloric Acid with the evolution of Hydrogen, and without any smell of Sulphuretted Hydrogen, and the solution gives a light blue precipitate with Ferrocyanide of Potassium.

**Test.**—Is easily ignited and converted into brown oxide. 10 grains added to an aqueous solution of 50 grains of Iodine and 50 grains of Iodide of Potassium, and digested with them in a small flask at a gentle heat, leave not more than 5 grains undissolved, which should be entirely soluble in Hydrochloric Acid.

This test yields very variable results depending upon the time and temperature used in the process.

Various other methods have been recommended, notably that of Wilner (*Y.B.P.* '81, 81), where the Metallic Iron is taken into solution by heating with excess of Mercuric Chloride, and titrated with Permanganate; also that of Fuge (*P.J.* xx. 1053). This latter is probably the simplest and best of all, but the author has made an unfortunate mistake in the quantity of Sulphate of Copper employed. In his own experiments the proportions used could only have yielded 56 or 75 per cent. of pure Iron, according as he used ·3 or ·4 gramme indicated in the test, and the figures recommended for an Official test could not possibly show a percentage higher than 90. The proportion of Copper Sulphate should be five times that of the Ferrum Redactum employed.

As there is no difficulty in obtaining Reduced Iron containing over 90 per cent. of Metal, the Official standard might conveniently be raised.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swiss and U.S.; not in Swed.)

**Medicinal Properties.**—It is one of the most powerful remedies in restoring the condition of the blood in all anæmic states of the system. It does not, however, possess the astringent properties of other preparations of Iron, and therefore cannot be used as a substitute in passive hæmorrhage. It is chiefly employed in chlorosis, amenorrhœa, chorea, and enlargement of the spleen following intermittent fever. There is no pulverulent state of Iron so convenient as this for children, as it has no taste, and a very small dose is required.

**Dose.**—1 to 5 grs. several times daily, in **powder** or in **pill** for children ¼ to 1 gr.
1 grain of this is equal to 5 grs. of Ammonio-Citrate of Iron.

An excellent **pill** can be made by mixing Reduced Iron, 24 grs.; Liquorice Powder, 6 grs.; Glycerine of Tragacanth, 6 grs.; and dividing into 12 or more pills as desired.

### Preparation.

**TROCHISCI FERRI REDACTI.**

Lozenges made of Reduced Iron, Sugar, and Gum Acacia.

Each lozenge contains 1 gr. of Reduced Iron.

**Dose.**—1 to 6 lozenges.

## FERRUM TARTARATUM.

### TARTARATED IRON.

*B.P.Syn.*—Ferri Potassio-Tartras; Ferrum Tartarizatum.

Thin transparent scales of a deep garnet colour; prepared by dissolving Ferric Hydrate in solution of Cream of Tartar, evaporating and scaling.

**Solubility,** 1 in 1 of Water, very sparingly in Spirit.

**Tests.**—The aqueous solution, acidulated with Hydrochloric Acid, gives a copious blue precipitate with Ferrocyanide, but none with Ferricyanide of Potassium (Ferric Salt). When the salt is boiled with Solution of Soda, Ferric Hydrate separates, and the filtered solution, when slightly acidulated by Acetic Acid, gives as it cools a crystalline deposit. By incinerating 50 grains of this preparation at a red heat, and washing what is left with distilled water and again incinerating, a residue of Peroxide of Iron is obtained, weighing about 15 grains.

It always contains Ferrous Salt, which precipitates with Ferricyanide of Potassium; the Oxide left after incineration is strongly magnetic, so that it cannot be wholly Peroxide.

If prepared from ordinary Bitartrate of Potassium, the residue will always contain Lime; it is recommended to use a Tartrate prepared from Tartaric Acid by semi-neutralisation with Potash.—*P.J.* xvi. 514.

**Dose.**—5 to 10 grs.

(Belg., Tartras Ferrico-Potassicus; Fr., Tartrate Ferrico-Potassique; Ital., Tartrato Ferrico-Potassico; Port., Tartrato de Potassa e de Ferro; Russ., Ferro-Kalium Tartaricum; Span., Tartrato Ferrico-Potasico; Swed., Tartras Ferrico-Kalicus; Swiss, Tartarus Ferratus; U.S., Ferri et Potassii Tartras; not in the others.)

## FICUS.

### FIG.

The dried fruit of *Ficus Carica.*

(Fr., Figue; Port., Figos Passados; Span., Higuera; U.S.; not in the others.)

**Medicinal Properties.**—Nutritious, laxative, and demulcent. Chiefly used medicinally in constipation. Cut open and heated, it is a convenient suppurative cataplasm.

Contained in Confectio Sennæ.

# FILIX MAS.

## MALE FERN.

The rhizome, with the persistent bases of the petioles of the perennial *Aspidium Filix-mas,* collected late in the autumn, and divested of its scales, roots, and all dead portions, and carefully dried with a gentle heat. Indigenous. It should not be used more than a year old.

(Austr., Belg., Dan., Dutch, Fr. (Fougère), Ger., Hung., Norw., Ital. (Felce Maschio), Port. (Feto Macho), Russ., Span. (Helecho Macho), Swed., Swiss, U.S. (Aspidium).)

**Medicinal Properties.**—The powder of the rhizome is slightly tonic and astringent; chiefly used in the form of Liquid Extract as an anthelmintic in tænia.

### Preparation.

**EXTRACTUM FILICIS LIQUIDUM.** *N.O.Syn.*—Oil of Male Fern.

Male Fern, in coarse powder, 1; Ether, 2½, or a sufficiency: pack the Male Fern closely in a percolator and pass the Ether slowly through it until it passes colourless; distil off the Ether, and preserve the oily extract.

**B.P.Dose.**—15 to 30 mins.

**Dose.**—60 to 90 minims in milk, or made into an **emulsion** with 1 to 2 drms. of very fresh Mucilage, or ½ to 1 drm. of powdered Acacia, or ½ drm. of Compound Powder of Tragacanth, and with Peppermint Water or Milk to form a 2 oz. draught; or in **capsules,** 15 minims in each. Best given on an empty stomach, and for tænia one-third part of the dose should be given at intervals of half an hour followed soon after by Castor Oil.

For larger doses than 90 minims, see *L.* '88, ii. 1037, and *B.M.J.* '89, i. 319.

The activity of the Extract is supposed to be due to **Filicic Acid.**—*P.J.* xxii. 84.

(Austr. and Russ., Ext. Filicis Maris; Belg., Dan., Dutch, Ger., Norw., Swed. and Swiss, Ext. Filicis; Fr., Extrait de Fougère Mâle; Hung., Extract. Filicis Maris Æthereum; Ital., Estratto di Felce Maschio Etereo; Port., Extracto de Feto Macho Ethereo; Span., Aceite de Helecho; U.S., Oleoresina Aspidii. All made with Ether.)

# FŒNICULI FRUCTUS.

## FENNEL FRUIT.

The dried fruit of cultivated plants of *Fœniculum capillaceum.*

The ash was determined of Fruits (4 samples) 8·47, 8·93, 9·75, 7·70 per cent.; of Pulvis Fœniculi (6 samples) 24·64, 12·8, 9·90, 8·91, 13·0, 9·89 per cent., the first contained sand.

(Austr., Belg., Dan., Dutch, Fr. (Fenouil Doux), Ger., Hung., Norw., Ital. (Finocchio), Port. (Funcho), Russ., Span. (Hinojo), Swed., Swiss and U.S.)

**Medicinal Properties.**—Stimulant, aromatic, and carminative. In action similar to Anise. Much employed as a corrigent of less agreeable medicines. In infantile subjects the infusion is frequently employed as an enema for flatus.

Used in the preparation of Pulvis Glycyrrhizæ Compositus.

### Preparation.

**AQUA FŒNICULI.**

Fennel Fruit, bruised, 1 ; Water, 20 : distil 10. =(1 in 10).

**Dose.**—1 to 2 oz.

(Austr., 1 in 20 ; Fr., Ital. and Port., 1 in 4 ; Ger. and Russ., 1 in 30 ; Hung. and Swed., 1 in 10 ; Span., 1 in 6 ; Swiss, 1 in 25 ; Belg., with Oil, 1 in 3000 ; Dan., with Oil, 1 in 2000 ; Dutch and U.S., with Oil, 1 in 500 ; not in Norw.)

Not Official.

**OLEUM FŒNICULI.**—A volatile Oil distilled from Fennel.

**Dose.**—5 to 15 minims.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Norw., Port., Russ., Span., Swed., Swiss and U.S. ; not in Ital.)

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Not Official.

## FUCUS VESICULOSUS.

Bladder-wrack collected from the rocks by the seaside and dried.

(Belg., Helmintochorton ; Fr., Varech Vesiculeux ; Port., Bodelha ; Span., Fuco Vejigoso ; not in the others.)

### Preparations.

**EXTRACTUM FUCI.**—Prepared by percolation in the same manner as the Fluid Extract, and evaporation of the resulting fluid to a stiff extract.

100 of dried Fucus yield about 16 of Extract.

**Dose.**—3 to 5 grs. in pill.

**EXTRACTUM FUCI LIQUIDUM.**—Dried Fucus Vesiculosus in No. 20 Powder, 16 ; percolate with a mixture of Rectified Spirit, 2 ; Water, 1 ; so that the resulting fluid shall measure 32.

**Dose.**—A teaspoonful, given for obesity ; it also diminishes glandular swellings in scrofulous cases.

Smelling fresh seaweed is said to relieve hay asthma.

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## GALBANUM.

GALBANUM.

A gum resin obtained from *Ferula galbaniflua and F. rubricaulis*, and probably other species.

For recent information as to geographical and botanical sources, *see P.J.* xxii. 194.

Usually heated to 212° F. (100° C.), and strained before using.

(Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span., Swed. and Swiss ; not in Hung. or U.S.)

**Medicinal Properties.**—Similar to Asafœtida, but less powerful. A stimulating expectorant. Chiefly used in chronic affections of the bronchial mucous membranes ; externally as a plaster to indolent swellings.

### Preparations.

**EMPLASTRUM GALBANI.**

Galbanum, 1 ; Ammoniacum, 1 : melt together and strain, then add them to Yellow Wax, 1 ; Lead Plaster, 8, previously melted together : mix. =(1 in 11).

(A plaster more or less resembling this is in all the Pharmacopœias except Hung. and U.S.)

**PILULA GALBANI COMPOSITA.** *See* PIL. ASAFŒTIDÆ COMPOSITA.

### Not Official.

**UNGUENTUM GALBANI COMPOSITUM.**—Galbanum Plaster, 4 oz.; Lead Plaster, 4 oz.; White Wax, 4 oz.; soft Extract of Opium, 1 drm.; Olive Oil, 20 oz.: melt together.

It is an excellent **application** for piles, boils, and carbuncles, for sore nipples and suppurating breasts.

### Not Official.

## GALIUM APARINE.

### CLEAVERS, GOOSE-GRASS.

This old remedy for scrofula still finds occasional notice. Besides its external application as a poultice, the general form of administration is the juice of the plant in wineglassful doses several times a day, but as the Succus cannot be preserved without 25 p.c. of Rectified Spirit, the quantity of Alcohol involved would in many cases preclude its use. The most suitable preparation therefore is a **Fluid Extract** prepared from the fresh plant.

## GALLA.

### GALLS.

Excrescences on *Quercus Lusitanica var. infectoria,* caused by the punctures and deposited ova of *Cynips Gallæ-tinctoriæ.*

Chiefly from the Mediterranean and the East Indies.

**Solubility.**—All the soluble matter of Galls is taken up by forty times their weight of boiling Water, and the residue is tasteless.

Galls contain 60 to 70 per cent. of Tannin or Tannic Acid, and 3 to 5 per cent. of Gallic Acid, to which their therapeutic qualities may be attributed.

(Austr., Belg., Dan., Dutch, Fr. (Galle de Chêne d'Alep), Ger., Hung., Ital. (Noci di Galla), Port. (Galha), Russ., Span. (Agalla), Swed., Swiss and U.S.)

**Medicinal Properties.**—Powerfully astringent. Useful in hæmorrhages, as menorrhagia, hæmaturia, and hæmoptysis; also in increased mucous and other discharges. Locally to suppress hæmorrhage from the gums, nose, &c.; to lessen the discharge from mucous membranes, as in gleet, leucorrhœa, &c.

**Dose.**—(Of powder) 10 to 20 grs. several times a day.

**Incompatibles.**—The Mineral Acids, Salts of Iron and Lead, Sulphate of Copper, Nitrate of Silver, Carbonates of Potassium and Sodium, Lime Water, Tartar Emetic, Ipecacuanha, and Opium, Infusions of Cinchona, Calumba, and Cusparia.

### Preparations.

**ACIDUM GALLICUM.**—*See* ACIDUM GALLICUM.

**ACIDUM TANNICUM.**—*See* ACIDUM TANNICUM.

**TINCTURA GALLÆ.**

Galls, in No. 40 powder, 1; Proof Spirit, 8: macerate for forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator, let it drain, and then pour on the remaining Spirit: when it ceases to drop, press the marc and add Proof Spirit to make 8.

**Dose.**—½ to 2 drms. =(1 in 8).

(Austr., Dan., Dutch, Fr., Ger., Hung., Russ., Swiss and U.S., 1 in 5: all by weight except U.S.; not in the others.)

### UNGUENTUM GALLÆ.

Galls, in very fine powder, 80 grs.; Benzoated Lard, 1 oz.: mix. =(1 in 6½).

(U.S., 1 in 5; not in the other Pharmacopœias.)

### UNGUENTUM GALLÆ CUM OPIO.

Ointment of Galls, 1 oz.; Opium, in powder, 32 grs.; mix. =(Opium, 1 in 14⅞).

It would facilitate calculations if the quantity of Opium were increased to 34 grs.; then the ratio would be 1, 2, 11, and the Ointment might be made direct by mixing 40 grs. of Opium and 80 grs. of Galls with 1 oz. of Benzoated Lard.

(Not in the other Pharmacopœias.)

A useful **application** for hæmorrhoids.

### Not Official.

**DECOCTUM GALLÆ.**—Bruised Galls, 2½; Distilled Water, 40: boil to 20 and strain. = (1 in 8).

An astringent **lotion** to suppress hæmorrhage from the gums or nose, and to lessen discharges from mucous surfaces.

**SUPPOSITORIA GALLÆ.**—5 grs. powdered Galls and 1 gr. Opium in each, with a basis of Cocoa-nut Stearine.

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### Not Official.

## GARCINIA PURPUREA.

KOKUM BUTTER TREE.

Grows in the forests of Malabar, the Concans, and other parts of the Madras Peninsula.

The oil of the seeds (*Kokum Butter*) is obtained by first exposing the seeds for some days to the action of the sun to dry; they are then bruised and boiled in water, the oil collects on the surface and on cooling contracts into a solid cake. It melts at 98° F. The seeds yield about 10 per cent. of oil.

It is used in India in the preparation of ointments, suppositories, &c.

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### Not Official.

## GAULTHERIÆ OLEUM.

*Syn.*—OIL OF WINTERGREEN, OIL OF BIRCH.

The name "Wintergreen" is also applied in the United States to *Pyrola umbellata*, and Wintergreen Oil has been wrongly listed as Oleum Pyrolæ. *Pyrola umbellata* yields no volatile Oil.—*P.J.* xxi. 838.

Colourless, yellow or reddish, of a peculiar aromatic odour and a slightly acid reaction.

The bulk of the Oil sold under this name is Oil of Sweet Birch (*Betula lenta*) or a mixture of the Oils of Wintergreen and Birch, but a limited amount of Pure Oil of Wintergreen (*Gaultheria procumbens*) can be obtained.

Oil of Birch is pure Salicylate of Methyl; the Oil of Wintergreen contains, in addition, a small quantity of Terpene, sp. g. ·940, with an odour resembling Black Pepper.—*P.J.* xix. 349, and *Squibb*, p. 950.

Sp. g. at 15° C.—Pure Oil of Birch, 1·182; Pure Oil of Wintergreen, 1·175—1·176.

Artificial Oil of Wintergreen (synthetic Salicylate of Methyl) was being manufactured by Schimmel in 1890 at the rate of 10,000 kilos per annum.

There is practically no chemical test by which this can be distinguished from the Natural Oil of either variety, so that the only useful test is for admixture with other oils.

This is effected by adding to 1 c.c. of the Oil, 10 c.c. of a 5 per cent. solution of Sodium Hydrate (12·2 c.c. Liquor Sodæ B.P.) and agitating the mixture. A bulky white precipitate of Sodium Methyl Salicylate is first produced, which after heating for a few minutes in a water-bath is resolved into Sodium Salicylate, and Methyl Alcohol forming a clear solution. Any adulterant will render the liquid turbid or will separate in oily drops (*A.D.* '92, 23), and as the Gaultheria odour is destroyed by the process, the smell of a foreign Oil may be detected.

The synthetic Methyl Salicylate has been found mixed with Methyl Benzoate.—*A.J.P.* '91, 49.

**Solubility.**—Readily soluble in Alcohol, Ether, and Chloroform.

**Tests.**—When heated to about 80° C. the Oil should not yield a colourless distillate having the characteristics of Chloroform or of Alcohol. On mixing 5 drops of the Oil with 5 drops of Nitric Acid, the mixture should not acquire a deep red colour and should not solidify to a dark red resinous mass (absence of Oil of Sassafras).

(Fr. and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—A valuable remedy in acute rheumatism internally, also externally mixed with equal parts of Olive Oil. Used largely as a flavouring agent in America, more particularly in dentifrices. It is a good antiseptic.

**Dose.**—10 to 15 minims every four hours, when given as a substitute for Salicylate of Sodium, but the taste is rather pungent.

### Preparation.

**SPIRITUS GAULTHERIÆ** (*U.S.*).—Oil of Gaultheria 5, Alcohol 95: both by measure: mix.

## GELATINUM.

### GELATINE.

It is described in the "B.P. Additions" as "the air-dried product of the action of boiling Water on gelatigenous animal tissues, such as skin, tendons, ligaments, and bones." "In translucent sheets or shreds. The solution in hot Water is colourless and inodorous, and solidifies to a jelly on cooling." These characters apply more particularly to "French Gelatine," which is less coloured than that made in this country, although from the point of odour some French samples of fine appearance and great tenacity leave much to be desired.

Commercial Gelatine varies considerably in its gelatinising power, and some test like the following would be useful as a standard:—

Place 5 grs. of Gelatine in a test-tube ($\frac{3}{4}$ in. diameter) with 250 grains of Water for half an hour, warm gently until dissolved, then place the test-tube in water at 60° F., and leave it undisturbed for 30 minutes, by which time a jelly should be formed of such consistence that it will remain in position if the test-tube be inverted.

There is no difficulty in obtaining Gelatine answering this test.

"Gelatine is insoluble in Alcohol and Ether. It dissolves in Acetic Acid. Its aqueous solution is not precipitated by diluted Acids, Alum, Acetate of Lead, or Perchloride of Iron; it is precipitated by Tannin."—*Brit. Pharm.*

Used in the preparation of Suppositoria Glycerini, p. 277.

(Austr., Dan., Fr., Hung., Norw., Port., Russ., Swed. and Swiss; not in the others.)

### Not Official.

**GELATINE BASIS FOR PESSARIES AND SUPPOSITORIES.**—Soften 1 oz. of Gelatine by allowing it to soak in 1 oz. of Water until it is absorbed, then dissolve in 3½ fl. oz. of Glycerine by the heat of a water-bath, and allow it to cool and solidify.

It can be medicated by melting it over a water-bath and suspending or dissolving in it substances in fine powder, and then pouring the mixture into moulds.

This formula has appeared in each edition of the *Companion* since 1877.

**GLYCO-GELATINE** (*T.H.*).—Refined Gelatine, 1 oz.; Glycerine (by weight), 2½ oz.; Ammoniacal Solution of Carmine, a sufficiency; Orange-flower Water, 2½ oz. Soak the Gelatine in the Water for 2 hours, then heat in a water-bath till dissolved; add the Glycerine and stir well together. Let the mixture cool, and when nearly cold add the Carmine Solution; mix till uniformly coloured, and set aside to solidify.

This mass is used for making the various medicated **Pastils**; the various substances are rubbed with an equal quantity of Glycerine, and added to the mass when melted over a water-bath.

## GELSEMIUM.

### YELLOW JASMINE.

The dried rhizome and rootlets of *Gelsemium nitidum* (*G. sempervirens*).

The plant, Carolina Jasmine, grows in the Southern States of North America.

The following constituents of Gelsemium have been described.

**Gelseminic Acid** is not known to have any medicinal properties, but affords reactions, which to some extent serve as a test for Gelsemium preparations, particularly the blue fluorescence which it produces in alkaline solutions.

**Gelsemin.**—A name given to a resinoid and eclectic remedy, called by Merck **Gelsemic Acid** to distinguish it from the alkaloids.

**Gelsemine.**—The crystallisable alkaloid forming crystalline salts, described by Gerrard (*P.J.* xiii. 641) and most unfortunately listed by Merck under the name "**Crystallised Gelseminine.**"

When quite free from Gelseminine, with which all early specimens were probably mixed, **Gelsemine** is stated (*Pr.* '93, li. 38) to be without action on *mammals*, even when injected intravenously up to ½ gramme. Gelseminine, on the other hand, is intensely poisonous, causing a descending paralysis of the central nervous system, ½ grain being the calculated lethal dose for an adult. Applied locally it produces dilatation of the pupil, and it is to the action of this alkaloid, modified by the various acid resins, that the action of Gelsemium Tincture is mainly due.

**Gelseminine.**—An amorphous alkaloid forming amorphous salts, intensely bitter and poisonous, listed by Merck as "**Amorphous Gelseminine.**"

(Belg., Dutch, Span., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—A respiratory and spinal sedative. Has been used in dental neuralgia, not arising from inflammation. According to Cushny in 1893 (*Pr.* li. 50) this drug should be used with care, and in the event of toxic symptoms presenting themselves, artificial respiration should be carried on.

**Dose.**—5 to 30 grs.

### Preparations.

**EXTRACTUM GELSEMII ALCOHOLICUM.**

Macerate Gelsemium (in No. 60 powder) 16, with Rectified Spirit 40, in a closed vessel forty-eight hours; pack in a percolator and let it drain, and then continue the percolation with Water until 40 of liquor have been collected: evaporate the percolate by a water-bath to a suitable consistence.

**Dose.**—½ to 2 grs.

(Belg.; Fr., from the leaves; not in the others. U.S., **Fluid Extract,** 1 in 1.)

**TINCTURA GELSEMII.**

Gelsemium, in No. 40 powder, 1; Proof Spirit, 8: macerate for forty-eight hours with 6 of the Spirit, agitating occasionally; pack in a percolator, let it drain, and then pour on the remaining Spirit; when it ceases to drop, press the marc, and add Proof Spirit to make 8. =(1 in 8).

For an investigation on alkaloidal estimations of this tincture, *see C.D.* '92, ii. 263. The important points are: (1) That the percentage of alkaloids in the tincture may vary between ·02 and ·076; (2) that a process of continuous percolation is greatly superior to the macero-percolation process of the B.P.; (3) that 60 to 70 per cent. alcohol (by volume) is the best menstruum for exhaustion.

Standardisation, however, according to total alkaloid, without the ratio of the two alkaloids, is not likely to be of much value.

**Dose.**—5 to 20 minims.

(Belg., 1 in 5; Dutch and Swiss, 1 in 10; U.S., 15 in 100: all by weight except U.S.; not in the others.)

**Antidotes.**—Emetic of Mustard and Water, Atropine, Morphine, Aromatic Spirit of Ammonia, Brandy, and Digitalis. Artificial respiration should be kept up very steadily for at least three hours.

A girl 9 years old was killed in 2 hours by two drachms of the tincture.

## GENTIANÆ RADIX.

### GENTIAN ROOT.

The dried root of *Gentiana lutea.*

Collected in the mountainous districts of Central and Southern Europe.

The active principle **Gentiopicrin** is a neutral crystalline body, soluble in Water and diluted Spirit, insoluble in Ether.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Genziana), Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Used in cases of atony of the stomach, or when a general tonic is required.

**Incompatibles.**—Sulphate of Iron, Nitrate of Silver, and Lead Salts.

### Preparations.

**EXTRACTUM GENTIANÆ.**

Gentian Root, sliced, 1; boiling Distilled Water, 10: infuse two hours, then boil fifteen minutes, press and strain, and evaporate over a water-bath to a pilular consistence.

The yield of Extract may be reckoned as 40 per cent. of the Root.

Has been largely used to form powders into pills.

**Dose.**—2 to 10 grs.

(Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span., Swed. and U.S., with cold water; Hung., with hot water; Swiss, with cold water, and purified with Alcohol; U.S., also **Fluid Extract,** 1 in 1.)

### INFUSUM GENTIANÆ COMPOSITUM.

Gentian Root, sliced, 55 grs.; Bitter Orange Peel, cut small, 55 grs.; Fresh Lemon Peel, cut small, ¼ oz.; Boiling Distilled Water, 10 oz.; infuse half an hour and strain. =(1 in 80).

**Dose.**—1 to 2 oz.

(Fr. (Tisane) Gentian Root 1, cold Water, 200; Swed., similar to Brit.; not in the others.)

### TINCTURA GENTIANÆ COMPOSITA.

Gentian Root cut small and bruised, 1½; Bitter Orange Peel, cut small and bruised, ¾; Cardamom Seeds, bruised, ¼; Proof Spirit, 20: macerate for forty-eight hours with 15 of the Spirit, agitating occasionally, pack in a percolator, let it drain, and then pour on the remaining Spirit; when it ceases to drop, press the marc and add Proof Spirit to make 20. =(1 in 13⅓).

**Dose.**—½ to 2 drms.

(Port., twice as strong as Brit.; U.S., 1 in 10; not in the others; Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span. and Swiss, have a simple Tincture, 1 in 5; all by weight except U.S.)

Not Official.

### MISTURA GENTIANÆ. B.P. 1867.

Gentian Root, sliced, ¼ oz.; Bitter Orange Peel, bruised, 30 grs.; Coriander, 30 grs.; Proof Spirit, 2 oz.; cold Distilled Water, 8 oz.; macerate the ingredients in the Spirit for two hours, then add the Water. Infuse for two hours and strain.

**Dose.**—½ to 1 oz.

(Is not strong enough to keep without change for more than fifteen or sixteen days.)

Not Official.

## LIQUID GLUCOSE.

As met with in commerce, it is clear, almost colourless, devoid of smell, and resembles in consistence Canada Balsam.

Alone, or mixed with equal parts of Treacle, it forms an excellent excipient for pills.

## GLUSIDUM.

### GLUSIDE.

*B.P. Syn.*—Glucusimide.

Gluside is commonly known as "Saccharin."

A sweet imide derivable from the toluene of Coal Tar.

A light white, minutely crystalline powder, having an intensely sweet taste in dilute solutions. Heated it fuses and then sublimes with partial decomposition.

The sweet taste is perceptible in solutions up to 1 in 100,000 of Water.

Although in the "Additions" the formula $C_6H_4CO.SO_2.NH.$ is attached to the synonym Benzol-sulphonic-imide, it is not to be inferred that commercial Saccharin is sufficiently pure to allow of its representation by this or any other formula.

Dr. Fahlberg, the discoverer and patentee, has admitted (*P.J.* xx. 501) that commercial Saccharin is not a pure product, but is "standardised" to 300 times the sweetening power of Cane Sugar, the pure chemical (Saccharin puriss.) being equal to 500 times its weight of Sugar. Both in this country and on the Continent, however, a considerably lower value is generally assigned to it. The proportion of impurity may be estimated by treatment with Ether, in which the pure salt is completely soluble.

**Solubility.**—1 in 400 of cold Water; 1 in 28 of boiling Water; 1 in 30 of Rectified Spirit; 1 in 100 of Ether; 1 in 500 of Chloroform; 1 in 48 of Glycerine.

It is also readily soluble in all alkaline solutions either of Hydrate, Carbonate, or Bicarbonate, acting the part of an Acid and displacing Carbonic Acid when present. *See* Soluble Saccharin.

**Tests.**—Neither Gluside nor Soluble Gluside is blackened by strong Sulphuric Acid, even when the mixture is gently warmed for a short time. On evaporating either with excess of strong solution of Soda, maintaining the residue in a state of semi-fusion for a few minutes, cooling, dissolving in Water, faintly acidulating with Hydrochloric Acid, and adding a few drops of Solution of Perchloride of Iron, a reddish-brown or purplish colour is produced.

0·18 gramme of Saccharin suspended in 5 c.c. of Water should dissolve on the addition of 1 c.c. of normal Potash Solution to form a neutral liquid; this liquid if heated to boiling after the addition of several c.c. of normal Potash Solution should not become coloured. If Saccharin be washed on a filter with several times its quantity of Ether, and the Ether mixed with ten times its quantity of Water, Ferric Chloride should not produce in it either a precipitate or a violet colour.

(Dan. and Swiss; not in the others.)

**Medicinal Properties.**—It is used as a substitute for Sugar in diabetes, one of Saccharin being equal (roughly) to 140 of Sugar. It is eliminated in the urine.

### Not Official.

**SACCHARINUM SOLUBILE ("SOLUBLE GLUSIDE").**—A soluble Saccharinate of Sodium, containing about 90 per cent. of Saccharin. It is much more palatable than ordinary Saccharin, which leaves a disagreeable after-taste.

This powder is soluble 1 in 15 of Water.

**ELIXIR SACCHARINI** (*B.P.C.*).—Saccharin, 480 grs.; Bicarbonate of Sodium, 240 grs.; Rectified Spirit, 2½ oz.; Distilled Water to make 20 oz. Dissolve the Saccharin and Bicarbonate of Sodium in 10 oz. of the Water, add the Spirit, filter, and wash the filter with Water to make 20 oz. Each fluid drachm contains 3 grains of Saccharin.

**Dose.**—5 to 20 minims.

**TABELLÆ SACCHARINI, SACCHARINE DISCS.**—Contain ½ grain Saccharin in each. Should be readily soluble in Water and should not contain Starch or Sugar.

# GLYCERINUM.

GLYCERINE.

A sweet principle, $C_3H_5\ (HO)_3$, eq. 92, obtained by reaction of fats and fixed oils with aqueous fluids, and containing a small percentage of Water.

The "reaction with aqueous fluids" alluded to above means practically either saponification with Caustic Alkali resulting in the formation of Soap and Glycerine, or decomposition of the fat by superheated steam resulting in the separation of free fatty Acid and Glycerine.

Glycerine is always produced during the alcoholic fermentation of Sugar to the extent of 3 per cent. of the Sugar employed, and consequently is present in all fermented liquids.

A clear colourless fluid, oily to the touch, without odour, of a sweet taste. When decomposed by heat it evolves intensely irritating vapours.

Glycerine is scarcely volatile at the temperature of a water-bath, and cannot be distilled without decomposition except in a current of steam.

**Solubility.**—In all proportions with Water and Alcohol, but insoluble in Chloroform, Ether, and Oils.

It possesses great powers as a solvent, and is an excellent excipient for many medicinal substances.

The following table is taken from Watts' Dictionary, 2nd supp. p. 563.

160 parts by weight of Glycerine dissolve at ordinary temperatures.

| Parts by weight. | | Parts by weight. | |
|---|---|---|---|
| 20 | . . Acid Arsenious. | 0·45 | . . Morphine. |
| 20 | . . Acid Arsenic. | 20 | . . Morphine Acetate. |
| 10 | . . Acid Benzoic. | 20 | . . Morphine Hydrochlorate. |
| 10 | . . Acid Boric. | 0·2 | . . Phosphorus. |
| 15 | . . Acid Oxalic. | 50 | . . Potassium Arseniate. |
| 50 | . . Acid Tannic. | 3·5 | . . Potassium Chlorate. |
| 40 | . . Alum. | 25 | . . Potassium Bromide. |
| 20 | . . Ammonium Carbonate. | 32 | . . Potassium Cyanide. |
| 20 | . . Ammonium Chloride. | 40 | . . Potassium Iodide. |
| 5·5 | . . Antim. Pot. Tartrate. | 0·5 | . . Quinine. |
| 3 | . . Atropine. | 0·25 | . . Quinine Tartrate. |
| 33 | . . Atropine Sulphate. | 50 | . . Sodium Arseniate. |
| 10 | . . Barium Chloride. | 60 | . . Sodium Biborate. |
| 2·2 | . . Brucine. | 8 | . . Sodium Bicarbonate. |
| 5 | . . Calcium Sulphide. | 98 | . . Sodium Carbonate. |
| 0·5 | . . Cinchonine. | 20 | . . Sodium Chlorate. |
| 6·7 | . . Cinchonine Sulphate. | 0·25 | . . Strychnine. |
| 10 | . . Copper Acetate. | 22·5 | . . Strychnine Sulphate. |
| 30 | . . Copper Sulphate. | 0·1 | . . Sulphur. |
| 1·9 | . . Iodine. | 50 | . . Urea. |
| 20 | . . Lead Acetate. | 1 | . . Veratrine. |
| 7·5 | . . Mercuric Chloride. | 50 | . . Zinc Chloride. |
| 27 | . . Mercuric Cyanide. | 35 | . . Zinc Sulphate. |

**Test.**—Official Sp. g. 1·250, and contains 5 per cent. of Water.

Usually found in commerce, sp. g. 1·260.

Its solution is not affected by Nitrate of Silver, Sulphydrate of Ammonium, Oxalate of Ammonium, or Chloride of Barium, and does not alter the colour of moistened blue or red litmus paper. Shaken with an equal volume of Sulphuric Acid, no colouration, or only a very slight straw colouration, should result. When gently heated with Diluted Sulphuric Acid, no rancid odour is produced.

When boiled with Water and Solution of Potash, it should not turn brown, indicating absence of Glucose.

Arsenic has been found in German Glycerine, and the following test has been proposed: paper moistened with a 50 per cent. solution of Nitrate of Silver, when exposed to Hydrogen Gas evolved by adding Zinc to a mixture of 2 c.c. of Glycerine with 3 c.c. of Hydrochloric Acid (sp. g. 1·124), should not within fifteen minutes show any yellow spots becoming black upon being moistened with Water.—*P.J.* xix. 865

It has been suggested (we think with advantage) to use a saturated solution of Mercuric Chloride in the place of Nitrate of Silver.—*P. J.* xx. 277.

P.G. III. gives:—"1 c.c. of Glycerine with 1 c.c. of Solution of Ammonia (·960) should be heated to boiling point, and three drops of Solution of Nitrate of Silver added. Neither colouration nor separation should occur in this mixture within five minutes from the addition of the Nitrate."

In working this test the Ammonia should be free from empyreumatic impurities, the ammoniacal mixture heated in a water-bath till bubbles of Ammonia gas just begin to come off, the Silver Nitrate added at once, and the test-tube removed from the bath. By overheating or evaporation of any large proportion of the Ammonia, a colouration or reduction may be obtained even with a very pure sample.

(Austr. and U.S., sp. g. 1·250; Belg., sp. g. 1·240; Dan., Ger., Hung. and Russ., sp. g. 1·225—1·235; Dutch, Norw. and Swed., sp. g. 1·230 to 1·250; Fr., sp. g. 1·242; Ital., sp. g. 1·269, also 1·234; Port. and Span., sp. g. 1·260; Swiss, sp. g. 1·230—1·235.)

**Medicinal Properties.**—A mild antiseptic. Internally it is given in coughs, and is recommended as an **anal injection** for constipation. 15 to 30 minims, or the same diluted with an equal quantity of Water, produces an evacuation very soon after the injection; also combined with Gelatine or Cocoa-nut Stearine to form a **suppository** for the same purpose. It prevents the formation of wind and acidity when taken in 1 or 2 drachm doses, and does not hinder digestion (*L.* '80, ii. 6); recommended in trichinosis (*L.M.R.* '81, 193). It has been proposed as a substitute for Cod-liver Oil, but its nutrient properties are far inferior. It is sometimes employed as a sweetening agent in the place of Syrup.

Externally in skin diseases, as pityriasis, herpes, eczema, psoriasis, prurigo, and lichen. Excellent for chilblains and chapped hands, but for this purpose it should be diluted with an equal volume of water.

Introduced into the ear on cotton-wool, it relieves deafness arising from dryness of the external meatus.

Used in poultices ($\frac{1}{14}$ or $\frac{1}{16}$), it keeps them soft for a long time.

**B.P.Dose.**—1 to 2 drms.; but small doses are usually prescribed.

## Preparations.

**SUPPOSITORIA GLYCERINI.**

Gelatine, cut small, ½ oz.; Glycerine, by weight, 2½ oz.: Distilled Water, a sufficiency. Place the Gelatine in a weighed evaporating dish with sufficient Water to cover it; after allowing it to stand for a minute or two pour away the excess of Water; set aside until the Gelatine is quite soft, then add the Glycerine. Dissolve over a water-bath and evaporate until the mixture weighs 1560 grains. Pour the product into suppository moulds holding 30, 60, or 120 grain-measures, or having other capacities as required.

Each suppository contains 70 per cent. by weight of Glycerine.

A similar preparation has been in use for many years ("Companion," 1877) as a basis for medicated Pessaries and Suppositories. The formula in the "Companion" arrives at the same result (70 per cent.) *without* evaporation. It is easy by evaporation to obtain a product containing 80 per cent. of Glycerine. The consistency of the mass will vary somewhat with the quality of the Gelatine, *see p.* 272.

**Glycerine Suppositories** are much more convenient to use when made with **Cocoa-nut Stearine,** *see below.*

| | |
|---|---|
| GLYCERINUM ACIDI CARBOLICI | 1 in 5. |
| GLYCERINUM ACIDI GALLICI | 1 in 4½. |
| GLYCERINUM ACIDI TANNICI | 1 in 4½. |
| GLYCERINUM ALUMINIS | 1 in 5½. |
| GLYCERINUM AMYLI | 1 in 7½. |
| GLYCERINUM BORACIS | 1 in 6¾. |
| GLYCERINUM PLUMBI SUBACETATIS | 1 in 2½. |
| GLYCERINUM TRAGACANTHÆ | 1 in 4⅔. |

The formulas for these are given under the several names quoted.

Used in the preparation of Extractum Cinchonæ Liquidum, of all Lamellæ, Linimentum Iodi, Linimentum Potassii Iodidi c. Sapone, Mel Boracis, Pilula Aloes et Myrrhæ, Pilula Ferri, Pilula Rhei Composita, Pilula Saponis Composita, Tinctura Kino and Unguentum Iodi.

### Not Official.

**DISPENSING SYRUP.**—Glycerine, Syrup, and Mucilage of Acacia, equal parts.

An **excipient for pills.** Glycerine by itself is too hygroscopic.

**GLYCERINE WITH ROSE WATER.**—Glycerine, 1; Rose Water, 3: mix.

**SUPPOSITORIA GLYCERINI C. STEARINO.**—Glycerine, 20 grs.; Cocoa-nut Stearine, 40 grs.; melt the Stearine, and when just fluid stir in the Glycerine and continue the stirring until the mixture becomes solid. Melt the mass with the least possible heat, and pour into moulds.

They can be used without any lubricant.

**UNGUENTUM GLYCERINI.**—*See* GLYCERINUM AMYLI.

## GLYCYRRHIZÆ RADIX.

### LIQUORICE ROOT.

The root and underground stems or stolons of *Glycyrrhiza glabra,* fresh and dried.

Fresh Liquorice Root is still official although its use in official preparations is discontinued; in former editions it was used for Decoctum Sarsæ Compositum and Infusum Lini.

By the description of both peeled and unpeeled Liquorice Root, the B.P. sanctions the use of the "Decorticated," which is generally employed, except in veterinary practice. The principle **Glycyrrhizin** is comparatively tasteless, the characteristic sweetness being only developed by combination with alkali. It exists in the Root as a combination with Ammonia.—*P.J.* vi. 54.

(In all the Pharmacopœias; Belg., Dutch, Fr. (Réglisse), Ital. (Liquirizia), Port. (Alcaçus), Span. (Regaliz), Swiss, and U.S., *G. glabra;* Russ., *G. echinata;* Austr., Dan., Ger., Hung., Norw. and Swed., both.)

**Medicinal Properties.**—An excellent demulcent as a decoction in catarrhal affections, irritation of the mucous membrane of the bowels and urinary passages; it helps to disguise the taste of nauseous medicines. A useful adjuvant to decoctions of bitter or irritating vegetable substances; is an ingredient in Compound Decoction of Aloes. In the form of extract and its solution it is a domestic remedy for cough.

Contained in Conf. Tereb., Dec. Sarsæ Co., Inf. Lini, Pilula Ferri Iodidi, Pil. Hydrargyri.

### Preparations.

### EXTRACTUM GLYCYRRHIZÆ.

Liquorice Root, in No. 20 powder, 1; cold Distilled Water, 5: macerate the Root in half of the Water for twelve hours, strain and press; again macerate the pressed marc with the remainder of the Water for six hours, strain and press; mix the strained liquors; heat to 212° F. (100° C.), strain through flannel, and evaporate over a water-bath to a pill consistence.

**Dose.**—5 grs. to 1 drm.

(Austr., Belg., Fr. (Ext. Réglisse), Hung., Ital., Port., Russ. and Span., from root with cold water; Dutch and U.S., from root with Water and Ammonia. The **Crude Extract** in sticks (*Succus Liquiritiæ*) is Official in Austr., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Russ., Swed., Swiss and U.S.; **Depuratum** from Crude Extract is Official in Austr., Belg., Dan., Ger., Hung., Norw., Swed. and Swiss.)

Contained in Confect. Sennæ, Decoctum Aloes Co., Tinct. Aloes, Trochisci Opii.

### EXTRACTUM GLYCYRRHIZÆ LIQUIDUM.

Process the same as for Extractum Glycyrrhizæ, except that the strained liquid is to be evaporated until, when cold, its sp. g. is 1·160, then add one-sixth of its volume of Rectified Spirit, let it stand for twelve hours, and filter.

2 fluid ounces of this = 1 oz. of solid extract.

**Dose.**—1 drm.

(U.S., Liquorice Root percolated with a mixture of Ammonia Water and diluted Alcohol.)

Used in the preparation of Mistura Sennæ Composita, and Tinctura Chloroformi et Morphinæ.

### PULVIS GLYCYRRHIZÆ COMPOSITUS. *B.P.Syn.*—PULVIS GLYCYRRHIZÆ COMPOSITUS CUM SULPHURE.

*N.O.Syn.*—PULVIS LIQUIRITIÆ COMPOSITUS, PULVIS PECTORALIS KURELLÆ.

Senna, in fine powder, Liquorice Root, in fine powder, of each 2; Fennel Fruit in fine powder, Sublimed Sulphur, of each 1; Refined Sugar, in powder, 6. Mix and pass through a fine sieve.

Note.—This preparation was put into the British Pharmacopœia 1874 because the German one was much prescribed; but in consequence of the formula being altered, it was incumbent on the chemist to keep both formulas. Brit. Pharm. 1885 have adopted the German formula, which has been given as a Not Official in the "Companion" since 1873.

**Dose.**—A teaspoonful or more for adults, less in proportion for children, as a mild aperient.

(Same as Austr., Dan., Dutch, Ger., Russ., and Swiss; Belg. and U.S., almost the same; not in the others.)

### Not Official.

**ELIXIR E SUCCO GLYCYRRHIZÆ,** *seu* **ELIXIR PECTORALE,** Dan., Ger., Russ. and Swiss.—Purified Extract of Liquorice, 1; Fennel Water, 3; Ψ Anisated Liquid Ammonia (p. 79), 1 (all by weight): mix.

**GLYCYRRHIZINUM AMMONIATUM,** Fr. and U.S.—A scale preparation made by treating Liquorice Root with Water and Water of Ammonia, and adding Sulphuric Acid to the liquor so long as a precipitate is produced; collect this and wash it with cold Water; redissolve in Dilute Ammonia and spread on glass plates to dry.

**GOA POWDER.**—*See* Chrysarobinum.

## GOSSYPIUM.

### COTTON WOOL.

*B.P.Syn.*—Cotton.

The hairs of the seed of *Gossypium barbadense,* and other species of Gossypium, from which fatty matter and all foreign impurities have been removed.

**Tests.**—Inodorous and tasteless. It should readily be wetted by water, to which it should not communicate either an alkaline or acid reaction. On ignition in air it burns leaving less than 1 per cent. of ash.

U.S. Soluble in an Ammoniacal Solution of Sulphate of Copper.

Used to protect burns and scalds from the air.

(Dutch, Ger. and Russ., Gossypium Depuratum; Ital., Cotone Assorbente; Port., Algodoeiro; Span., Algodon; U.S.; Fr., Coton, not washed; not in the others. Medicated Cottons have been inserted in Dutch.)

Used in the preparation of Pyroxylin.

Cotton wool is medicated with Carbolic Acid, Salicylic Acid, Boric Acid, Eucalyptol, Thymol, Arnica, Glycerine, Perchloride of Iron, Mercuric Chloride, Sal Alembroth, Iodine, and with Iodoform.

Professor Tyndall introduced cotton wool as a filter in respirators.

Mouth and Nose Protector.—For use in poisonous and injurious trades. We exhibited this respirator at the International Health Exhibition, and obtained for it a bronze medal. It consists of layers of washed and sterilised cotton wool placed between perforated zinc and perforated cardboard, formed into a pliable respirator which covers the mouth and nose.

Not Official.

## GOSSYPII RADICIS CORTEX.

The bark of the root of *Gossypium herbaceum*, and of other species of Gossypium.
(U.S.; not in the other Pharmacopœias.)

Preparations.

**TINCTURA GOSSYPII.**—Dried bark of the root of the cotton plant in powder, 1; percolate with sufficient Proof Spirit to produce 4.

**Dose.**—1 drm. three times a day as an emmenagogue and parturient.

**EXTRACTUM GOSSYPII FLUIDUM** (U.S.), 1 in 1, made with Glycerine and Alcohol.

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# GRANATI RADICIS CORTEX.

POMEGRANATE ROOT BARK.

The dried bark of the root of *Punica granatum.*

Recent examination has shown that alkaloids in stem bark do not often exceed ·5 per cent. (*P.J.* xviii. 822); but that the root bark may vary from 1·7 in the black-flowered variety to 2·4 in the red-flowered, and 3·7 in the white.—(*P.J.* xxi. 379.)

It is said to lose active properties and become inert on keeping, but this is contradicted by De Vry, who made a very efficient extract from a root-bark eleven years old.—(*Y.B.P.* '74, 505; and *P.J.* xxi. 758.)

The Pomegranate-root alkaloids are Pelletierin (Punicin), Isopelletierin (Isopunicin), Methylpelletierin (Methylpunicin), and Pseudopelletierin (Pseudopunicin). The first two constitute the **Pelletierin** of medicine, the last two are inactive.—*Merck.*

Pelletierin is a liquid, and volatile, but forms stable salts.

(Austr., Belg., Dan., Dutch, Fr. (Grenadier) Ger., Hung., Ital. (Melogranato), Port. (Romeira), Russ., Span. (Granado), Swiss and U.S. Not in Norw. or Swed.)

**Medicinal Properties.**—Astringent and anthelmintic. It is considered effective in expelling tapeworm. Both in a green and dry state it is found equally effective in India. The dried is imported.

**Incompatibles.**—Alkalies, Lime Water, Metallic Salts, Gelatine.

Preparation.

**DECOCTUM GRANATI RADICIS.**

Pomegranate Root Bark, sliced, 1; Distilled Water, 20: boil to 10, and strain, making the strained product up to 10, if necessary by pouring Distilled Water over the contents of the strainer.
=(1 in 10).

**B.P.Dose.**—2 to 4 oz.

(Belg., 1 and 6, boil to 4; Fr. (Apozème), 1 and 12½, boil to 9; Port. 1, and 7½, boil to 5; Span., 1 in 8; not in the others.)

Not Official.

An excellent remedy for tapeworm is as follows:—

Bruised Root-bark of Pomegranate, 2 oz; Boiling Water, 24 oz.: macerate for 24 hours, and then boil till reduced to 18 oz. A third part early in the morning, a third part again in half an hour, and the remainder in another half-hour. A dose of Castor Oil should have been taken the previous morning, and solid food abstained from on that day. This rarely fails to bring away the entire worm in two hours, and the head at the thinnest end should be diligently sought for.

**EXTRACTUM GRANATI.**—Exhaust Pomegranate Root Bark with Proof Spirit, distil off the Spirit and evaporate to the consistence of an Extract.

10 of Root Bark yields $3\frac{1}{2}$ of Extract.

(Austr., Belg., Dutch, Fr., Hung., Port., Russ. and Span.; not in the others.)

**PELLETIERINÆ SULPHAS.**—A viscid liquid.

**Dose.**—6 grains prescribed with 7 grains of Tannic Acid.

**PELLETIERINÆ TANNAS.**—A yellowish amorphous powder prepared from Pomegranate Bark. Soluble 1 in about 700 of Water, 1 in 80 of Alcohol.

It is given as a remedy for tapeworm.

**Dose.**—10 to 20 grains followed by Castor Oil.

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### Not Official.

## GRINDELIA.

The leaves and flowering tops, *Grindelia robusta* and *Grindelia squarrosa* from California.

The drug as imported into this country is not *G. robusta*, but *G. squarrosa*, but it is quite equal to that species in the amount of resin it contains, and indeed appears to be one of the richest in medicinal properties of the whole genus.—*P. J.* viii. 787.

There is no evidence connecting any one of the chemical constituents with the medicinal action of the drug.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been recommended in asthma, hay fever, bronchitis, and whooping-cough.

### Preparations.

**EXTRACTUM GRINDELIÆ.**—A Rectified Spirit percolate, distilled and evaporated to an Extract. 100 of Grindelia yields 15 of Extract.

**Dose.**—3 grains three times a day.

**EXTRACTUM GRINDELIÆ LIQUIDUM** (*B.P.C.*).—Grindelia, in No. 20 powder, 20; percolate with Rectified Spirit, reserve the first 17, distil off the Spirit from the remainder, and evaporate to a soft extract, dissolve this in the reserved portion and add enough Rectified Spirit to make 20.

This is the U.S. P. process, which, however, uses a somewhat stronger Spirit.

**Dose.**—10 to 20 mins. every half-hour until relief is obtained.

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## GUAIACI LIGNUM.

### GUAIACUM WOOD.

*N.O.Syn.*—LIGNUM-VITÆ.

The heart-wood of *Guaiacum officinale*, or of *Guaiacum sanctum*.

Imported from St. Domingo and Jamaica.

For use in Pharmacy the wood, as usually imported, should be deprived of its sap-wood, and the heart-wood reduced to the form of chips, raspings, or shavings.

**Tests.**—When touched with Nitric Acid, they assume a temporary bluish-green colour; and if moderately heated in a solution of Perchloride of Mercury, a bluish-green colour is also produced.

Yields about 26 per cent. of resin.

(In all the Pharmacopœias, except Dan., Dutch and Hung.)

Not often prescribed alone.

Contained in Decoctum Sarsæ Compositum.

## GUAIACI RESINA.

### GUAIACUM RESIN.

The resin obtained from the stem of *Guaiacum officinale,* or of *Guaiacum sanctum,* by natural exudation, by incision, or by heat.

In large masses or in tears of a brownish or greenish-brown colour; fractured surface resinous, translucent at the edges.

When freshly powdered it is almost white, but soon changes to green on exposure to air.

On dry distillation it yields **Guaiacol** similar to that found in Creasote.

**Solubility.**—About 90 per cent. is soluble in Alcohol, Ether, Chloroform, Aromatic Spirit of Ammonia, and Alkaline solutions; almost insoluble in Benzin.

**Tests.**—A solution in Rectified Spirit strikes a clear blue colour when applied to the inner surface of a paring of raw potato.

When paper moistened with the solution is exposed to the fumes of Nitric Acid it becomes blue.

The addition of Ferric Chloride to a solution or mixture containing Guaiacum produces a blue colour which may be shaken out with Chloroform. This test is very delicate.

(Austr., Belg., Dan., Fr. (Gayac Resine), Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Dutch or Ger.)

**Medicinal Properties.**—Stimulant, diaphoretic, and alterative. It is employed in chronic forms of rheumatism. It is useful in tonsillitis, also in dysmenorrhœa.

Generally prescribed in composition with other medicines.

**Dose.**—10 to 30 grs. three or four times a day until it causes hot sweating, with or without purging.

**Incompatibles.**—Mineral Acids, Spirit of Nitrous Ether.

Contained in Pilula Hydrargyri Subchloridi Composita.

### Preparations.

**MISTURA GUAIACI.**

Guaiacum Resin, in powder, 2; Sugar, 2; Gum Acacia in powder, 1; Cinnamon Water, 80: triturate, adding the Cinnamon Water gradually.

**Dose.**—½ to 2 oz. =(1 in 40).

(Swed. (Emulsio Guaiaci) 1 in 25 with Peppermint Water. Not in the other Pharmacopœias.)

NOTE.—**Gum Acacia** does not suspend the Guaiacum well. It falls, and forms a compact sediment, which is difficult to disturb by shaking. If one-third the quantity of **Tragacanth** is used instead, it answers well; with the latter the colour of the mixture does not change so rapidly nor to the same extent.

### TINCTURA GUAIACI AMMONIATA.

Macerate Guaiacum Resin, in powder, 4, with Aromatic Spirit of Ammonia, 15, for seven days, filter, and wash the filter with sufficient Aromatic Spirit of Ammonia to make 20. =(1 in 5).

**Dose.**—½ to 1 drm. Although Tragacanth is better for Guaiacum in powder, Mucilage of Acacia is better for this tincture; Mucilage ½ oz., Am. Tincture 6 drms., Water to 6 oz.

(U.S., similar to Brit.; Norw. and Swed., Guaiacum Resin 3, Aqua Ammoniæ (sp. g. ·960) 5, and Spirit 10; Port., Guaiacum Resin 3, Liquid Ammonia (sp. g. ·916) 3, Spirit 14; by weight; not in the others.)

### Not Official.

**TINCTURA GUAIACI.**—Guaiacum Resin, 1; Rectified Spirit, 5: digest seven days.

(Austr., Belg., Dan., Fr., Hung., Russ., Span. and U.S. (Resin) 1 in 5; Belg., Port., Span. and Swiss (Wood) 1 in 5: all by weight except U.S.; not in the others.)

**TROCHISCI GUAIACI** (*T.H.*).—Made with Black Currant Paste. Each lozenge contains 2 grains of Guaiacum Resin. A specific in arresting crescent inflammation of the tonsils.

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### Not Official.

## GUARANA.

The Seeds of *Paullinia sorbilis* dried in the sun, and then roasted and reduced to a fine powder; this is moistened with a little Water, exposed to the night dew, and when got into a hard paste is rolled into cylinders; these are further dried in the sun or in the chimneys of the huts. It is exported from Brazil.

True Guarana is very hard, heavy, and, when powdered, is reddish-grey, whilst the sophisticated is much lighter in colour; it contains about 4 per cent. of an alkaloid generally considered to be identical with Caffeine, but producing modified physiological effects.

(Austr., Belg., Fr., Hung., Ital., Port., Span., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—It is used chiefly for curing sick headache, but is also useful in diarrhœa, dysentery, and as a tonic and stomachic in convalescence.

**Dose.**—30 grains, and repeated if necessary in 2 hours.

### Preparations.

**ELIXIR GUARANÆ** (*B.P.C.*).—Guarana, in No. 60 powder, 4 oz.; Light Magnesia, ½ oz.; Oil of Cinnamon, 6 mins.; Syrup, 2 oz.; Proof Spirit, a sufficiency. Mix the powders and moisten them with 3 oz. Proof Spirit; after 24 hours, mix with 8 oz. of coarse Sand and percolate with Proof Spirit until 16 oz. are obtained, then press. To the percolate add the Syrup and Oil of Cinnamon, and make up to 20 oz. with expressed liquid previously reduced by evaporation if necessary.

**Dose.**—30 to 120 minims.

To ascertain the effect of the Magnesia and Sand in percolating Guarana, three quantities were taken and percolated 1 to 4 with Proof Spirit, and tested for total extractive and alkaloid.

I. Guarana alone in impalpable powder.
II. The above with the addition of ⅛ Light Magnesia.
III. No. 2 with 2 parts of Sand mixed in after maceration.

| RESULT. | I. | II. | III. |
|---|---|---|---|
| Per cent. of Extract in Proof Spirit percolate | 6·93 | 3·08 | 2·9 |
| Per cent. of Alkaloid in Proof Spirit Extract . | 13·4 | 40·0 | 38·6 |
| Per cent. of Alkaloid extracted from Guarana . | 3·72 | 4·92 | 4·48 |

From this it would appear that if Guarana is prescribed as a substitute for Caffeine, the Magnesia treatment is rather an advantage; but in all other cases where the astringent extractive may be supposed to take part in the curative effect, the use of Magnesia is strongly contra-indicated. As pointed out (*P.J.* xviii. 348) the addition of Sand is scarcely an advantage.

**EXTRACTUM GUARANÆ FLUIDUM** (U.S.).—1 equals 1 of Guarana; made with Alcohol, 3; Water, 1.

**TINCTURA GUARANÆ.**—Guarana, in fine powder, 1; Rectified Spirit, 4; macerate the Guarana with 3 of the Spirit for three days, stirring occasionally; allow it to settle, pour off the clear fluid, transfer the Guarana to a glass funnel plugged with Cotton Wool, allow it to drain, pour on sufficient Spirit to yield with decanted portion 4. Almost the whole of the Spirit retained by the Guarana can be recovered by careful displacement with Water.

**Dose.**—1 to 2 drms. in water.

## GUMMI RUBRUM.—*See* EUCALYPTI GUMMI.

# GUTTA PERCHA.

GUTTA PERCHA.

The concrete juice of *Dichopsis gutta*, and of several other trees of the natural order Sapotaceæ.

In tough, somewhat flexible pieces, of a light brown or chocolate colour.

**Solubility.**—Almost entirely soluble in Chloroform, yielding a more or less turbid solution. Entirely soluble in Oil of Turpentine, Carbon Bisulphide, and Benzol. Insoluble in Water, Alcohol, Alkaline solutions, or dilute Acids.

(Fr., Ger., Hung., Port., Russ., Span. and Swed.; not in the others.)

**Medicinal Properties.**—Used for making **splints**; as Gutta Percha **tissue** for preventing evaporation from applications; as a **solution** for mixing with medicaments to form plasters, or to be applied like Collodion.

### Preparation.

### LIQUOR GUTTA PERCHA.

Gutta Percha, in thin slices, 1; Chloroform, 8; Carbonate of Lead, in fine powder, 1. Add the Gutta Percha to 6 of the Chloroform in a stoppered bottle, and shake them together frequently until solution has been effected. Then add the Carbonate of Lead previously mixed with the remainder of the Chloroform, and having several times shaken the whole together, set the mixture aside, and let it remain at rest until the insoluble matter has subsided. Lastly, decant the clear liquid, and keep it in a well-stoppered bottle.

Used only in the preparation of Charta Sinapis.

(Not in the other Pharmacopœias.)

Not Official.

**TRAUMATICINE.**—A solution of 1 Gutta Percha tissue in 10 (by weight) of Chloroform. It produces a thin delicate film when painted on the skin, and causes neither tension nor pain. It is used for medicated applications.—*P.J.* xiv. 341.

**UNNA'S PLASTER MULLS** consist of a very thin sheet of Gutta Percha coated on one side with an adhesive substance (Aluminium Oleinicum) containing one or more medicinal substances, and backed on the other side with Mull (undressed muslin).—*L.* '86, ii. 575.

Not Official.

## GYNOCARDIÆ OLEUM.

CHAULMUGRA OIL.

Obtained from the seeds of *Gynocardia odorata*, a native of the forests of the Malayan Peninsula and Eastern India, as far north as Assam, extending thence along the base of the Himalayas as far west as Sikkim. The oil has been long known and used in India; it is solid, of a light brown colour, with a disagreeable taste and smell, and can be readily melted by a gentle heat.

**Medicinal Properties.**—It has been recommended in the treatment of leprosy and other skin diseases, chronic rheumatism and gout, and secondary syphilis. Good results have been obtained from its external as well as internal administration in phthisis.—*B.M.J.* '80, ii. 844.

**Dose.**—2 to 15 grains (or minims if fluid); it is best to begin with a small dose, 2 to 3 grains three or four times a day, gradually increasing; should be given after meals in Milk or emulsion with Gum Acacia.

An **ointment** can be made of a strength about 1 in 4, with a mixture of Hard and Soft Paraffins, or other basis.

**GYNOCARDIC ACID.**—Chaulmugra Oil contains about 12 per cent. of an active principle, Gynocardic Acid, the dose of which is ½ grain in **pill** three times daily, gradually increasing to 2 grains.

**Gynocardate of Magnesium.**—A granular powder. Dose.—1 to 3 grains.

## HÆMATOXYLI LIGNUM.

LOGWOOD.

The heart-wood of *Hæmatoxylon campechianum* sliced.

Imported from Campeachy in Central America, from Honduras and Jamaica; that from Campeachy being the most valuable.

The cherry-red inner wood is the part used.

It is said to be fermented to develop colour before coming into the market, and is recommended to be used *unfermented* for medicinal purposes (*P.J.* xviii. 285), but there is no direct evidence that the latter is therapeutically superior. Whatever reputation Logwood may possess was probably obtained from the fermented wood, in which the Hæmatoxylin would be more or less oxidised. The general view is that the Tannin was responsible for much of the astringency, but Siebold (*loc. cit.*) asserts that Tannin does not exist in the wood in quantity sufficient to be of any importance, and ascribes the whole virtue to Hæmatoxylin. But unoxidised Hæmatoxylin has no astringency whatever, so that if Siebold is correct about the Tannin, one of two things must be true. Either (1) Astringency has nothing to do with the medicinal properties of Logwood; or (2) Siebold's inference is a mistaken one and the *fermented* wood may after all be the best to use.

(Austr., Belg., Fr. (Bois de Campêche), Port. (Campeche), Russ., Swed. (Lignum Campechianum), U.S.; not in the others.)

**Medicinal Properties.**—The decoction is a mild astringent, without irritating properties, useful in atonic dyspepsia and ordinary chronic diarrhœa and dysentery, and in passive hæmorrhages; also as an injection for leucorrhœa.

**Incompatibles.**—Mineral Acids, Metallic Salts, Lime Water, Tartar Emetic.

### Preparations.

### DECOCTUM HÆMATOXYLI.

Logwood, in chips, 1 oz.; Cinnamon, bruised, 55 grs.; Distilled Water, 20 oz.: boil the Logwood in the Water for ten minutes, adding the Cinnamon towards the end, strain, and pour on the contents of the strainer sufficient Distilled Water to make 20 oz. =(1 in 20).

Iron vessels should not be used.

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias.)

### EXTRACTUM HÆMATOXYLI.

Logwood, in fine chips, 1; boiling Distilled Water, 10: infuse twenty-four hours, boil to 5, strain, and evaporate to dryness by a water bath, stirring with a wooden spatula. Iron vessels should not be used.

**Dose.**—10 to 30 grs.

(Same as Belg. and U.S.; not in the others.)

### Not Official.

**EXTRACTUM HÆMATOXYLI LIQUIDUM** (*B.P.C.*).—*Unfermented* Logwood, in No. 16 powder, 10; boil it with 20 of Distilled Water for half an hour and strain; boil it with 20 more of Water for half an hour and strain; repeat the process for the third time, and having mixed the strained liquors, evaporate over a water-bath (or preferably in vacuo) to the measure of 10; allow it to settle for a week, then draw off the clear liquor from the sediment.

The product has a fine red colour and sp. g. 1·06.—*P.J.* xviii. 285.

**Dose.**—30 to 120 minims.

**HÆMATOXYLIN** ($C_{16}H_{14}O_6$).—Sparingly soluble in cold Water, readily in Alcohol and Ether. It has a sweet taste, without astringency. Used in preparing solutions for staining histological specimens.

## HAMAMELIDIS CORTEX.

### HAMAMELIS BARK.

*B.P.Syn.*—WITCH HAZEL BARK.

The dried bark of *Hamamelis virginica*.

**Medicinal Properties.**—The bark and leaves are powerfully astringent and hæmostatic. Valuable in various forms of passive hæmorrhage, epistaxis, hæmoptysis, hæmatemesis, menorrhagia, and piles, also for varicose veins.

### Preparation.

**TINCTURA HAMAMELIDIS.**

Hamamelis Bark in No. 20 powder, 1; Proof Spirit, a sufficiency: moisten the powder with a suitable quantity of the menstruum, and macerate for twenty-four hours; pack in a percolator, and gradually add Proof Spirit until 10 of Tincture is obtained. =(1 in 10).

This is the same formula as *B.P.C.* 1889 and "Companion" 1877.

**Dose.**—5 to 60 minims.

### Not Official.

**EXTRACTUM HAMAMELIDIS.**—Hamamelis Bark in powder, percolated with Proof Spirit and the percolate evaporated to the consistence of an extract.

Yield of Extract, 20 to 25 per cent.

**Dose.**—½ to 2 grains in **pill**; 1½ grains in **suppositories**; 1 drm. in 7 drms. of Soft Paraffin or other diluent, for an **ointment.**

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## HAMAMELIDIS FOLIA.

### HAMAMELIS LEAVES.

*B.P.Syn.*—WITCH HAZEL LEAVES.

The dried leaves of *Hamamelis virginica.*

(U.S.; not in the other Pharmacopœias.)

### Preparations.

**EXTRACTUM HAMAMELIDIS LIQUIDUM.**

Hamamelis Leaves in No. 40 powder, 20; percolate with a mixture of Rectified Spirit 1, Distilled Water 2, till exhausted; reserve the first 17 of the percolate and evaporate the remainder to a soft Extract, dissolve the latter in the reserved percolate and add sufficient menstruum to measure 20. =(1 in 1).

**Dose.**—2 to 5 minims in Water; much larger doses are also given.

(U.S.; not in the other Pharmacopœias.)

**UNGUENTUM HAMAMELIDIS.**

Liquid Extract of Hamamelis 50 minims or 1 fluid part; Simple Ointment, 410 grains or 9 parts: mix thoroughly. =(1 in 10).

### Not Official.

**DISTILLED EXTRACT OF WITCH HAZEL.**—A distilled product from weak Spirit and the leaves and twigs of Hamamelis; recommended as a styptic, and largely sold as proprietary articles under the names "Pond's Extract" and "Hazeline." It probably owes its virtues to the presence of a small quantity of essential Oil.

Chiefly used externally.

**HAMAMELIN.**—A powdered extractive.

**Dose.**—1 to 5 grains.

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### Not Official.

## HELLEBORUS.

### CHRISTMAS ROSE.

The rhizome and rootlets of *Helleborus niger.*

(It may be noted that "White Hellebore" is Veratrum Album, and "Green Hellebore" is Veratrum Viride.)

(Belg., Fr., Port. and Span.; not in the others.)

**Medicinal Properties.**—A hydragogue cathartic and emmenagogue. Poisonous in large doses.

### Preparation.

**TINCTURA HELLEBORI.**—Hellebore Root, 1; percolated with Proof Spirit to obtain 8.

**Dose.**—20 to 60 minims in water.

(Port. 1 in 5; not in the other Pharmacopœias.)

## HEMIDESMI RADIX.

### HEMIDESMUS ROOT.

The root of *Hemidesmus Indicus* (Indian Sarsaparilla), dried.

Imported from India.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—Diuretic. Useful as an alterative in some diseases of the kidneys.

It was brought to England by Dr. Ashburner about the year 1830, and was prescribed for skin diseases and indigestion, like Sarsaparilla, but it did not prove very satisfactory, and is now used chiefly as a flavouring agent.

### Preparation.

**SYRUPUS HEMIDESMI.**

Hemidesmus Root, bruised, 1; Refined Sugar, 7; boiling Distilled Water, 5: infuse the root in the Water for four hours, and strain; set it by till the sediment subsides, decant the clear liquor, add the Sugar, and dissolve by a gentle heat. The product should weigh 10½ and measure 8. Sp. g. about 1·335. =(1 in 8).

**Dose.**—1 drm.

(Not in the other Pharmacopœias.)

## HIRUDO.

### THE LEECH.

*Sanguisuga medicinalis*, the Speckled Leech (English Leech), belly greenish-yellow, spotted with black.

*S. officinalis*, the Green Leech, belly olive-green, not spotted.

Imported chiefly from Hamburg. Also collected in large numbers in Spain, France, Italy, and Hungary.

Used for the abstraction of blood from congested parts.

Bleeding from leech bites is sometimes difficult to stop. The following remedies have been applied with advantage:—Matico, Solution of Perchloride of Iron, Nitrate of Silver Point, saturated Solution of Alum, and pressure on the part.

(Austr., Belg., Dan., Dutch, Fr. (Sangsue Medicinale), Ger., Hung., Ital., Port. (Sanguesugas), Span. (Sanguijuela), Swed. and Swiss. Not in the others.)

# HOMATROPINÆ HYDROBROMAS.

HYDROBROMATE OF HOMATROPINE.

$C_{16}H_{21}NO_3,H.Br$, eq. 356.

The Hydrobromate of an alkaloid prepared from Tropine.

Atropine, under the action of Barium Hydrate, splits up into Tropic Acid and Tropine; the latter, combined with Amygdalic Acid and acted upon by diluted Hydrochloric Acid, forms Oxytoluyl-tropeine or Homatropine.

A white crystalline powder or aggregation of minute prismatic crystals.

**Solubility.**—1 in 6 of Water; 1 in 18 of Rectified Spirit.

(Dan., Dutch, Ger., Russ. and Swiss; not in the others.)

**Tests.**—If 2 minims of Chloroform be shaken with 10 minims of a 10 per cent. aqueous solution and Chlorine Water be cautiously added, the Chloroform will assume a brownish colour.

This is obviously a test for Hydrobromic Acid, but would it not be better to shake with Chloroform *after*, rather than *before*, the addition of Chlorine Water?

A 2 per cent. aqueous solution is not precipitated by the cautious addition of Solution of Ammonia previously diluted with twice its volume of Water.

A 2 per cent. solution of Atropine Sulphate under the same conditions gives a distinct turbidity, but with Hyoscyamine and Hyoscine Hydrobromates no reaction is visible. As a 1 per cent. solution of Atropine Sulphate, however, remains unchanged, and the Guttæ Atropinæ, Homatropinæ, and Hyoscinæ of the *London Ophthalmic Hospital* each contain but 2 grains of the respective salts per fluid ounce, this test is not capable of distinguishing between these solutions.

About a tenth of a grain moistened with 2 minims of Nitric Acid and evaporated to dryness on the water-bath yields a residue which is coloured yellow by an Alcoholic Solution of Potash.

This is the most characteristic test for Homatropine. Atropine gives a deep purple colouration, as do also Hyoscyamine and Hyoscine, but in the case of the latter two, the colour is less intense and more transient.

If about a tenth of a grain be dissolved in a little Water, and the solution be made alkaline with Ammonia and shaken with Chloroform, the separated Chloroform will leave on evaporation a residue which will turn yellow and finally brick-red when warmed with about 15 minims of a solution of 2 grains of Perchloride of Mercury in 100 minims of Proof Spirit.

Any salt of Atropine or Hyoscyamine under exactly similar conditions will give the same reaction, but with Hyoscine no formation of Mercuric Oxide appears to take place.

**Medicinal Properties.**—Dilates the pupil more rapidly than Atropine, and its effects disappear sooner. When used with Cocaine the action is quicker and more powerful.

### Not Official.

**GUTTÆ HOMATROPINÆ** (*L.O.H.*).—Hydrobromate of Homatropine, 4 grs.; Distilled Water, 1 oz.—Also *London Hospital.*

**HOMATROPINA.**—Colourless crystals, not deliquescent, nearly insoluble in Water, but soluble 1 in 80 of Olive Oil, 1 in 20 of Castor Oil, and combines readily with Oleic Acid.

Used in cases where an oily preparation or an ointment is required.

**LAMELLÆ HOMATROPINÆ.**—Discs of Gelatine containing $\frac{1}{5000}$ grain of Homatropine.

**OLEUM HOMATROPINÆ CUM COCAINÆ** (*L.O.H.*).—Homatropine pure, 10 grs.; Cocaine (alkaloid) 10 grs.; Castor Oil, 1 oz.: heat together till dissolved.

## HORDEUM DECORTICATUM.

PEARL BARLEY.

The dried seed of *Hordeum distichon*, divested of its integuments: from plants cultivated in Britain.

(Belg., Fr. (Orge Perlé), Ital. (Orzo), Port. (Cevada Santa), Span. (Cebada); not in the others.)

### Preparation.

**DECOCTUM HORDEI.**

Pearl Barley, 1; wash the Barley with cold Water, and reject the washings; boil the washed Barley with 15 of Distilled Water for twenty minutes in a covered vessel, and strain. Product about 10.
=(about 1 in 10).

(Dutch, 8 in 100; Fr. (Tisane d'Orge), 1 in 50; not in the others.)

**Medicinal Properties.**—Demulcent, used as a drink in the sick-room.

**Dose.**—1 to 4 oz.

## HYDRARGYRUM.

MERCURY.

Hg, eq. 200.

A metal, fluid at common temperatures, brilliantly lustrous, and easily divisible into spherical globules.

It becomes solid at —39° F. (—39·4° C.) Sp. g. 13·5. Boils at 360° C., but volatilises slightly even at the ordinary temperature.

From China, Almaden in Spain, and Idria in Carniola; also from Peru and California. It is chiefly obtained from its Sulphuret (native Cinnabar) by distillation with Lime; but it is sometimes found in globules disseminated through the ore.

Mercury, as imported, is, after being squeezed through leather, nearly free from impurities. It was first employed medicinally by the Arabian physicians Avicenna and Rhazes, but they only ventured to use it externally against vermin and cutaneous diseases. We are indebted to that renowned empiric Paracelsus for its administration internally.—*Pereira, Mat. Med.* 1849.

**Test.**—Entirely volatilised at a temperature below that of visible redness, leaving no residue.

(In all the Pharmacopœias.)

**Medicinal Properties.**—Mercury as a metal is seldom given alone. In a state of minute sub-division with Chalk, however, it has the effect of increasing the various secretions, its influence upon the salivary glands being the ordinary index of the extent of its action. It is alterative, cholagogue, and purgative. It causes the absorption and prevents the formation of morbid effusions, and is itself absorbed in all the tissues of the body.

It is used in congestion of the liver, and in acute and chronic inflammation.

Of great use in syphilis, but the doses should not be such as to cause salivation.

Externally, as a topical stimulant to indurated and chronically inflamed parts, and sometimes for introducing the metal into the system.

## Preparations.

### EMPLASTRUM HYDRARGYRI.

Mercury, 3 oz. (by weight); Olive Oil, 56 grs. (by weight); Sublimed Sulphur, 8 grs.; Lead Plaster, 6 oz.: heat the Oil, add the Sulphur to it gradually, stirring till they unite; add the Mercury, and triturate till its globules disappear; then add to the mixture the Lead Plaster, previously liquefied, and mix the whole thoroughly. =(about 1 in 3).

(Austr., Dan., Ger., Hung., Ital., Port., Russ., Swed. and Swiss, 1 in 5; Belg., 1 in 5·25; Dutch, 1 in 4; Fr., 1 in 5·6; Span., 1 in 7·5; U.S., 3 in 10: the ingredients differ considerably. Not in Norw.)

### EMPLASTRUM AMMONIACI CUM HYDRARGYRO.

Ammoniacum, 12 oz.; Mercury, 3 oz. (by weight); Olive Oil, 56 grs. (by weight); Sublimed Sulphur, 8 grs.: heat the Oil, and add the Sulphur to it gradually, stirring till they unite. With this mixture triturate the Mercury until globules are no longer visible; and lastly, add the Ammoniacum, previously liquefied by heat, mixing the whole carefully. =(nearly 1 in 5).

Applied as a discutient to glandular swellings, syphilitic nodes, and in chronic synovitis

(U.S. resembles Brit.; not in the other Pharmacopœias.)

### LINIMENTUM HYDRARGYRI.

Ointment of Mercury, 1; Solution of Ammonia, 1; Liniment of Camphor, 1: mix the Solution of Ammonia with half of the Liniment of Camphor, rub the Mercurial Ointment with the other half, then mix them together. =(1 Ointment in 3, or 1 of Mercury in 6).

(Not in the other Pharmacopœias.)

A stimulating Liniment, applied to indolent ulcers; placed with lint in the armpits, it is a sure mode of producing salivation.

### PILULA HYDRARGYRI. *B.P.Syn.*—Blue Pill.

Mercury, 2 (by weight); Confection of Roses, 3; Liquorice Root in fine powder, 1: rub the Mercury with the Confection of Roses until metallic globules are no longer visible, then add the Liquorice, and mix the whole well together. =(1 in 3).

8 commercial samples examined contained 28 to 41 p. c. of Mercury, and little or no Oxide; 5 of the 8 samples were prepared with Confection of Hips.—*P.J.* xv. 230.

**Dose.**—3 to 8 grs.

(Belg., Pilulæ Hydrargyricæ; Fr., Pilules Mercurielles Simples; Port., Pilulas Mercurials; Swed., Pilulæ Hydrargyri; U.S., Massa Hydrargyri; all 1 in 3; not in the others.)

## SUPPOSITORIA HYDRARGYRI.

Ointment of Mercury, 60 grs.; Oil of Theobroma, 120 grs.: melt the Oil with sufficient heat, add the Ointment of Mercury, and stir till well mixed, and without applying more heat, immediately pour into moulds, the capacity of 15 grs. each; or the fluid mixture may be allowed to cool and then be divided into 12 equal parts, each of which shall be made into a conical or other convenient form of suppository.

Each suppository contains 5 grs. of Mercurial Ointment.

## UNGUENTUM HYDRARGYRI.

Mercury, 16 (by weight); Prepared Lard, 16; Prepared Suet, 1: rub them together until metallic globules cease to be visible.

=(nearly 1 in 2).

8 commercial samples examined contained 38 to 46 p. c. of Mercury; 4 of them contained small proportions of Oleate.—*P.J.* xv. 230.

(Belg., Fr., Port. and U.S., 1 in 2: Fr. has also Pommade Mercurielle Faible, 1 in 8; Span. (Pomada Mercurial Doble), and Ital. (Pomata Mercuriale), 1 in 2; Span. (P. M. Terciada), 1 in 3, and (P. M. Simple), 1 in 6; Austr., Ger., Hung., Russ. and Swiss (Ung. Hydr. Ciner.), 1 in 3; Dutch, 1 in 4; Dan., Norw. and Swed., 1 in 5.)

## UNGUENTUM HYDRARGYRI COMPOSITUM.

Ointment of Mercury, 6; Yellow Wax, 3; Olive Oil, 3 (by weight); Camphor, 1½: melt the Wax and the Oil, then incorporate the Ointment of Mercury, and when the mixture is nearly cold, add the Camphor in powder and stir the whole thoroughly together.

=(1 Mercury in 4½).

If cold Ointment of Mercury be added as directed, it causes a lumpy separation of the Wax, and makes it very difficult to rub the Ointment smooth. There is no reason why the whole of the ingredients should not be melted up together, except for a very slight volatilisation of Camphor.

This is Scott's celebrated absorbent Ointment, the Soap Cerate being replaced by the Oil and Wax.

It is an admirable Ointment to apply to carbuncles and other indolent tumours.

### Not Official.

**MERCURY PLASTER MULL (UNNA).**—Containing 1 grain of Mercury to the square inch.

**MERCURY AND CARBOLIC PLASTER MULL (UNNA).**—Containing 1 grain of Mercury and ⅜ grain of Carbolic Acid to the square inch.

**OLEUM CINEREUM.** "Grey Oil."—White Vaseline, 2·5; Mercurial Ointment, 1; Mercury, 19·5; triturate in a warm mortar until the Mercury is extinguished; then add White Vaseline, 7; Liquid Vaseline, 20: all by weight.

This preparation contains 40 p. c. of Mercury.—*P.J.* xix. 704.

**Medicinal Properties.**—For **hypodermic injection** in syphilis. **Dose.**—1 to 2 minims.—*B.M.J.* '88, i. 1296.

Not Official.

## HYDRARGYRI CYANIDUM.

$Hg(CN)_2$.

Colourless crystals. Not decomposed by Alkalies.

**Solubility.**—1 in 13 of Water; 1 in 20 of Rectified Spirit.

(U.S.; Belg.,' Cyanuretum Hydrargyri; Fr., Cyanure Mercurique; Ger., Hung. and Russ., Hydrargyrum Cyanatum; Port., Cyaneto Mercurico; Span., Cianuro Mercurico.)

**Medicinal Properties.**—A powerful antiseptic. Used as a local **application** (5 to 15 grains in 1 oz. of Water) to syphilitic rashes and sores of the throat, tongue, &c.—*Ringer.*

In diphtheria the following **mixture** is recommended: Cyanide of Mercury, $\frac{1}{3}$ grain; Tincture of Aconite, 35 minims; Honey, 2 oz. Mix. Give a teaspoonful every 15, 30, or 60 minutes, according to age. No brushing of the throat is practised. A **gargle,** 1 in 10,000, to be used every 15 minutes.—*L.* '88, i. 591, 1063.

Ph. Ger. maximum single dose, $\frac{1}{2}$ grain; maximum daily dose, $1\frac{1}{2}$ grains.

T. H. has a varnished **Pill** containing $\frac{1}{10}$ grain in each. 1 pill twice a day.

**ZINCO-CYANIDE OF MERCURY.**—A product which has been found by Sir Joseph Lister to have valuable antiseptic properties.—*P.J.* xx. 653; xxii. 769.

There is also a **gauze** prepared with it.—*B.M.J.* '89, ii. 1025; *L.* '89, ii. 943.

## HYDRARGYRI IODIDUM RUBRUM.

RED IODIDE OF MERCURY.

*B.P.Syn.*—BINIODIDE OF MERCURY. MERCURIC IODIDE.

$HgI_2$, eq. 454.

A crystalline powder of a vermilion colour, becoming yellow when gently heated over a lamp on a sheet of paper; prepared by precipitating Mercuric Chloride with Iodide of Potassium in hot solution.

**Solubility.**—Almost insoluble in Water; sparingly soluble in Glycerine; 1 in 300 of Rectified Spirit; 1 in 70 of Ether; 1 in 280 of Olive or Almond Oil or Lard; 1 in 50 of Castor Oil; insoluble in Vaseline; freely in an aqueous solution of Iodide of Potassium or Perchloride of Mercury.

The double Iodide of Mercury and Potassium will dissolve readily in Oils.—*C.D.* '85, 597.

**Tests.**—It sublimes entirely at a heat below redness. When digested with Solution of Soda it assumes a reddish-brown colour, and the fluid cleared by filtration and mixed with Solution of Starch gives a blue precipitate on being acidulated with Nitric Acid.

(U.S.; Austr. and Hung., Hydrargyrum Bijodatum Rubrum; Belg., Deuto-Ioduretum Hydrargyri; Dan., Iodetum Hydrargyricum Rubrum; Dutch, Iodetum Hydrargyricum; Fr., Iodure Mercurique; Ger., Russ. and Swiss, Hydrargyrum Bijodatum; Ital., Bijoduro di Mercurio; Port., Iodeto Mercurico; Span., Ioduro Mercurico; Swed., Iodetum Hydrargyricum Præcipitatum; not in Norw.)

**Medicinal Properties.**—A powerful irritant poison, similar to the Green Iodide, only much more active. It is used internally in the same cases as Corrosive Sublimate, more particularly in syphilis.

**Dose.**—$\frac{1}{32}$ to $\frac{1}{8}$ grain.

Usually given in the form of **pilules.**

Used in the preparation of Liquor Arsenii et Hydrargyri Iodidi.

### Preparation.

### UNGUENTUM HYDRARGYRI IODIDI RUBRI.

Red Iodide of Mercury in very fine powder, 16 grs.; Simple Ointment, 1 oz.: mix. =(1 in 28).

(Ital., 1 in 10; not in the other Pharmacopœias.)

**Medicinal Properties.**—A most effective application for bronchocele, and a good application for warts and syphilitic nodes. An application for lupus.

If applied to the eyelids, should be diluted to $\frac{1}{4}$ the strength, and even then it is a rubefacient to delicate skins.

### Not Official.

**HYDRARGYRI ET POTASSII IODIDI.**—Yellow acicular crystals.

An aqueous **solution** of 1 in 12,000 is a powerful antiseptic.—*T.G.* '85, 826.

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### Not Official.

## HYDRARGYRI IODIDUM VIRIDE.

### GREEN IODIDE OF MERCURY.

### HgI, eq. 327.

A dull green powder, which darkens in colour upon exposure to light.

This was official in the B.P. of 1867.

Mercury, 1 oz. (by weight); Iodine, 278 grs.; Rectified Spirit, a sufficiency; rub the Iodine and Mercury in a porcelain mortar, occasionally moistening the mixture with a few drops of the Spirit to prevent violent action, and continue the trituration until metallic globules are no longer visible, and the whole assumes a green colour; then wash the product with Rectified Spirit and finally dry it in a dark room, on filtering-paper, by simple exposure to the air, and preserve in an opaque bottle.

This should be freshly made, as Biniodide of Mercury forms after being kept some time, and becomes evident as minute red specks pervading the mass.

It is better to use one-fifth more Mercury and keep the powder in the dark, or in amber-tinted bottles; Absolute Alcohol is better than Rectified Spirit for moistening it.—*P.J.* xxi. 259.

Processes for the precipitation of a Yellow Iodide, which appears to be more stable than the Green variety, *see Y.B.P.* '73, 154, and '79, 138; also *P.J.* xix. 680.

**Insoluble** in Water, Alcohol, and Ether.

**Tests.**—Entirely volatilised at a red heat. When shaken in a tube with Ether, nothing is dissolved. Is not acted upon by Aniline at a boiling heat, but if Biniodide be present, a magenta colour is produced.

This latter test is stated (*P.J.* xxi. 259) not to give the reaction, while Ether would extract traces of Red Iodide; but (*P.J.* xiv. 989) points out that the Ether washing decomposes the Green Iodide with formation of Red Iodide, and that although this also happens with Chloroform, yet it is to a much less extent.

(U.S.; Austr. and Hung., Hydrargyrum Jodatum flavum; Belg., Proto Ioduretum Hydrargyri; Dutch and Swed., Iodetum Hydrargyrosum; Fr., Iodure Mercureux; Ital., Proto-Joduro di Mercurio; Port., Iodeto Mercuroso; Swiss, Hydrargyrum Jodatum; Span., Ioduro Mercurioso. Not in Norw.)

**Medicinal Properties.**—An irritant poison, similar to Calomel in action. Given in syphilis when the Red Iodide cannot be borne. In small repeated doses it acts upon the lymphatic and glandular systems, and sometimes causes salivation. Employed as an **ointment** (1 part to 8 of Lard) for scrofulous and venereal eruptions, and chronic skin diseases.

**Dose.**—It varies with different prescribers from $\frac{1}{6}$ grain to 2 grains.

**Incompatible** with soluble Iodides.—*C.D.* '92, ii. 275.

### Preparations.

**PILULA HYDRARGYRI IODIDI VIRIDIS** (*B.S.H.*).—Green Iodide of Mercury, $\frac{1}{2}$ gr.; Opium, $\frac{1}{4}$ gr.; Extract of Gentian, 2 grs.

**UNGUENTUM HYDRARGYRI IODIDI VIRIDIS CUM ATROPINA.**—Green Iodide of Mercury, 10 grs.; Atropine, 1 gr.; Lard, $\frac{1}{2}$ oz.

This ointment is most useful in softening and reducing indurated Fascia of the hand, which causes the fingers to close upon the palm.

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## HYDRARGYRI NITRATIS LIQUOR ACIDUS.

### ACID SOLUTION OF NITRATE OF MERCURY.

*B.P.Syn.*—ACID SOLUTION OF MERCURIC NITRATE; ACID SOLUTION OF PERNITRATE OF MERCURY.

Pernitrate of Mercury, **Hg 2NO$_3$**, eq. 324, in solution in Nitric Acid. A colourless and strongly acid solution.

Mercury, 4 (by weight); Nitric Acid, 5; Distilled Water, $1\frac{1}{2}$: mix the Nitric Acid with the Water in a flask, and dissolve the Mercury in the mixture without the application of heat. Boil gently for fifteen minutes, cool, and preserve the solution, which should weigh about 12 oz., in a stoppered bottle away from the light.

**Tests.**—Sp. g. about 2·0. Gives a yellow precipitate with Solution of Potash added in excess. Does not give any precipitate when a little of it is dropped into Hydrochloric Acid, diluted with twice its volume of Water (absence of Mercurous Salt).

(U.S., sp. g. 2·100; Belg., Nitras Hydrargyri liquidus, sp. g. 1·44—1·45; Fr., Azotate Mercurique Liquide, sp. g. 2·246; Ital., Nitrato Mercurico liquido, sp. g. 2·250; Port., Soluto de Azotato Mercurico; Span., Nitrato Mercurico Acido, sp. g. 2·246; Swed., Solutio Nitratis Hydrargyri; not in the others.)

**Medicinal Properties.**—Caustic. Applied to syphilitic warts, ulcers, tubercles, &c. Used in cancerous diseases and in lupus. As a **gargle**, 1 or 2 minims to 1 oz. water. As an **injection** in gonorrhœa, 1 minim to 2 oz. water.

### Preparations.

**UNGUENTUM HYDRARGYRI NITRATIS.** *B.P.Syn.*—UNGUENTUM CITRINUM.

Mercury, 4 (by weight); Nitric Acid, 12; Prepared Lard, 15; Olive Oil, 32; dissolve the Mercury in the Nitric Acid with the aid of a gentle heat; melt the Lard in the Oil by a steam or water bath in a porcelain vessel capable of holding six times the quantity, and while the mixture is at about 212° F. (100° C.) add the solution of Mercury, also at about 212° F., mixing them thoroughly. If the mixture does not froth up, increase the heat till this occurs and stir till cold. (The heat required for this is 170° to 180° F.). =(about 1 in 15½).

**Medicinal Properties.**—Applied in chronic diseases of the skin as a stimulant and alterative; very efficacious in eczema; in ophthalmic diseases, and in tinea ciliaris, it is diluted with 1 or 2 parts of Spermaceti Ointment, and applied by means of a camel's-hair pencil to the eyelids.

We are chiefly indebted to Dr. Duncan for the improved formula which, with some modification, is adopted by the British Pharmacopœia, so that we have now an ointment that remains soft, and retains its beautiful lemon colour for a long time. This Ointment, however, on being diluted with Lard, soon acquires a leaden colour; it changes less with Spermaceti Ointment, and least of all when diluted with Soft Paraffin.

Belg., Mercury, 2; Nitric Acid (sp. g. 1·33), 3; Lard, 12; Olive Oil, 12.
Fr., Mercury, 1; Nitric Acid (sp. g. 1·39), 2; Lard, 10; Olive Oil, 10.
Port., Sol. Mercuric Nitrate, 2; Lard, 9; Olive Oil, 9.
Span., Mercury, 2; Nitric Acid (sp. g. 1·32), 3; Lard, 16; Olive Oil, 16.
Swed., Mercury, 1; Nitric Acid (sp. g. 1·5), 2; Lard, 12.
U.S., Mercury, 7; Nitric Acid (sp. g. 1·414), 17·5; Lard Oil, 76.

**Incompatibles.**—All reducing agents, Camphor, Essential Oils, Lard, etc.

### UNGUENTUM HYDRARGYRI NITRATIS DILUTUM.

Nitrate of Mercury Ointment, 1; Soft Paraffin, 2: mix.

### Not Official.

**VASELINUM HYDRARGYRI NITRATIS.**—The Author prepared some Citrine Ointment, using the same proportion of Mercury, but only half the Acid ordered in the Pharmacopœia; in the place of the Lard and Olive Oil he used White Vaseline. The Acid and Mercury are put into a flask and heated gently until solution is effected; the Vaseline is heated in a water-bath to 180° F.; the solution is then poured into the Vaseline, and stirred together till cold.

It makes a nice ointment and keeps well; it may be diluted to any extent with White Vaseline without impairing in the least the beautiful lemon colour it possesses. Yellow Vaseline may be used to dilute it, but not to prepare it.

A less acid preparation can be made by triturating 1 of Crystallised Pernitrate of Mercury with 8 of Soft Paraffin.

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## HYDRARGYRI OLEATUM.

### OLEATE OF MERCURY.

Yellow Oxide of Mercury, 1; Oleic Acid (by weight), 9; to the Oleic Acid, kept stirred in a mortar, add gradually the Oxide of Mercury and triturate occasionally until all is dissolved.

A light brown, oleaginous semi-solid substance, composed of Oleate of Mercury and Oleic Acid, and having the usual smell of Oleic Acid.

This Oleate may be prepared with half the above proportions of Oleic Acid, the remainder being added just before, or not long before, the Oleate is dispensed.

Although recently precipitated Yellow Oxide of Mercury may dissolve in the Oleic Acid somewhat more readily than any other, a levigated Red Oxide is practically as good, and in fact with time and a temperature not exceeding 120° F., the Oxide in any form will answer the purpose.

The awkward point in making this preparation is that the first combination is a basic Oleate, melting at a considerably higher temperature than the normal Oleate, and which takes some time and a deal of rubbing to disintegrate so as to allow the further action of the Oleic Acid.

This "lumping" may be largely prevented, and the process facilitated, by first rubbing the Oxide with Ether and then mixing rapidly with the whole of the Oleic Acid.

An Oleate containing 20 per cent. is readily made as follows:—Mercuric Oxide (finely powdered), 4; Oleic Acid (by weight), 16; Ether (·720), 1: mix the Oxide of Mercury with the Ether and stir in rapidly the whole of the Oleic Acid, warm to 120° F., stirring frequently till the Oxide is dissolved. The operation should be complete in 1 to 2 hours.

Oleate of Mercury was introduced by Prof. Marshall in 1872, and was made of three different strengths, containing respectively 5 per cent., 10 per cent., and 20 per cent. of Oxide of Mercury.

The 5 per cent. very quickly changed to a black colour owing to reduction of the Mercuric Oxide; the 10 per cent. kept better but not very long without change. It is better to keep the 20 per cent. and dilute it when required for use.

(U.S. same as Brit.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been strongly recommended as an application for persistent or chronic inflammation in the joints or other parts near to the skin, more particularly when combined with Morphine. It is useful, placed in the axilla, for syphilis; also as an application for non-ulcerated syphilitic indurations.

A good application for killing pediculi.

### Not Official.

**HYDRARGYRI OLEATUM C. MORPHINA** is made by dissolving 1 grain of Morphine Alkaloid in each drachm of the Oleate of Mercury.

## HYDRARGYRI OXIDUM FLAVUM.

YELLOW OXIDE OF MERCURY.

*B.P.Syn.*—Yellow Mercuric Oxide.

HgO, eq. 216.

Perchloride of Mercury, 4 oz.; Solution of Soda, 40 oz.; Distilled Water, a sufficiency.

Dissolve the Perchloride of Mercury in 80 ounces of Distilled Water, aiding the solution by the application of heat, and add this to the Solution of Soda. Stir them together; allow the yellow precipitate to subside; remove the supernatant liquor by decantation; thoroughly wash the precipitated Oxide on a calico filter with Distilled Water; and finally dry it by the heat of a water-bath.

A yellow powder, readily dissolved by Hydrochloric Acid, yielding a solution which with Solution of Ammonia gives a white precipitate.

**Solubility.**—Practically insoluble in Water or Rectified Spirit.

**Tests.**—It is entirely volatilised when heated to incipient redness, being resolved into Oxygen gas and the vapour of Mercury.

1 gr. to 60 grs. of spermaceti ointment (sine Benzoino) is the proper strength for the eyelids.

(Austr., Hung. and Swiss, Hydrargyrum oxydatum flavum; Belg., Oxydum Hydrargyri Flavum; Dan. and Dutch, Oxydum Hydrargyricum Flavum; Fr., Oxyde Mercurique Jaune; Ger., Russ. and Swiss, Hydrargyrum oxydatum viâ humidâ paratum; Ital., Ossido Mercurico Giallo; Norw., Oxidum Hydrargyricum; Span., Oxido Mercurico Amarillo; Swed., Oxydum Hydrargyricum Præcipitatum; U.S., Hyd. Oxid. Flav.)

### Not Official.

**UNGUENTUM HYDRARGYRI OXIDI FLAVI** (*B.S.H.*).—Yellow Oxide of Mercury, 15 grs.; Benzoated Lard, 1 oz.; mix.

**Medicinal Properties.**—Used in cases of chronic eczema, pityriasis, ringworm, chronic lichen, and syphilitic eruptions.

Diluted with an equal or twice the quantity of Vaseline, used for corneal ulceration and ophthalmia tarsi.

(Dutch, Yellow Oxide 1, White Vaseline 19; Fr. (Pommade avec l'Oxyde Jaune de Mercure), Yellow Oxide 1, Vaseline 15; Russ., Yellow Oxide 1, Lard 49; U.S., Yellow Oxide 10, Lard 72, Yellow Wax 18; not in the others.)

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## HYDRARGYRI OXIDUM RUBRUM.

### RED OXIDE OF MERCURY.

*B.P.Syn.*—Hydrargyri Nitrico-Oxidum (Lond.); Red Mercuric Oxide.

$HgO$, eq. 216.

An orange-red powder obtained by heating Mercurous Nitrate carefully until Nitrous fumes cease to be given off. The Mercurous Nitrate is made by evaporating to dryness a quantity of Liquor Hydrargyri Nitratis Acidus and triturating the residue with a weight of Mercury equal to that used in its preparation.

**Solubility.**—Insoluble in Water and Rectified Spirit; readily soluble in Hydrochloric Acid.

**Tests.**—Entirely volatilised at a red heat, being at the same time decomposed into Mercury and Oxygen. If this be done in a test-tube, no orange vapours are perceived—indicating absence of Nitrate. The solution in Hydrochloric Acid gives a yellow precipitate with Solution of Potash in excess, and a white precipitate with Solution of Ammonia.

(U.S.; Belg. Oxydum Hydrargyri Rubrum; Dan., Dutch, Norw. and Swed., Oxydum Hydrargyricum; Fr., Oxide Mercurique Rouge; Ger. and Swiss, Hydrargyrum Oxydatum; Ital., Ossido Mercurico Rosso; Port., Oxydo Mercurico; Russ., Hydrargyrum Oxydatum Levigatum; Span., Oxido Mercurico Rojo. Not in Austr. or Hung.)

**Medicinal Properties.**—A powerful irritant. Not used internally. Employed, either in powder or ointment, as an escharotic to indolent ulcers.

### Preparation.

### UNGUENTUM HYDRARGYRI OXIDI RUBRI.

Red Oxide of Mercury in very fine powder, 62 grs.; Hard Paraffin, ¼ oz.; Soft Paraffin, ¾ oz.; melt the Hard and Soft Paraffins together, and when the mixture in cooling begins to thicken, add the Oxide of Mercury in a glass or porcelain mortar and mix the whole thoroughly. =(1 in 8).

In making this preparation it is as well to discard the Official directions altogether as they can only result in a lumpy product.

Use a Hard Paraffin melting at 120°—125° F. Melt the Paraffins in a pot, and before allowing to cool mix in the levigated Oxide, and stir carefully with a spatula while cooling. A perfectly smooth Ointment will result.

There is no advantage in *slow* cooling, if the thickened Ointment be continuously removed from the sides of the pot.

Much diluted, was used for ulcerations of the cornea, but the Ointment of Precipitated Oxide is preferred.

Red Oxide with both Lard and Simple Cerate soon gets blue by keeping; with Spermaceti Ointment, however, it keeps its colour for months.

This ointment was formerly made with Yellow Wax and Oil of Almonds, but in B.P. 1885 these are replaced with the Hard and Soft Paraffins.

(Belg., 1 in 50; Dan., Dutch, Norw., Port. and Swiss, 1 in 20; Fr. and Span., 1 in 16; Ger. and U.S., 1 in 10; Russ., with Yellow Oxide (p. 299). Not in Austr., Hung., Ital. or Swed.)

## HYDRARGYRI PERCHLORIDUM.

### PERCHLORIDE OF MERCURY.

$HgCl_2$, eq. 271.

*B.P.Syn.*—HYDRARGYRUM CORROSIVUM SUBLIMATUM (Brit. 1864); HYDRARGYRI BICHLORIDUM (Lond.); SUBLIMATUS CORROSIVUS (Edin.); SUBLIMATUM CORROSIVUM (Dub.); CORROSIVE SUBLIMATE; MERCURIC CHLORIDE.

In heavy colourless masses of prismatic crystals, obtained (B.P.) by subliming a mixture of Persulphate of Mercury, Chloride of Sodium, and a little Black Oxide of Manganese.

**Solubility.**—1 in 19 of Water; 1 in 5 of Rectified Spirit; 1 in 3 of Absolute Alcohol; 1 in 6 of Ether, B.P. (·735); 1 in 11 of Ether Purus (·720); 2 in 3 of Glycerine.

**Tests.**—Entirely soluble in Ether. When heated, it sublimes without decomposition, or leaving any residue. Its aqueous solution gives a yellow precipitate with Caustic Potash, a white precipitate with Ammonia, and a curdy white precipitate with Nitrate of Silver.

An aqueous solution when boiled with Copper foil, gives a grey deposit, which assumes a silvery lustre on being rubbed.

In a Glycerine solution Potash does not cause a precipitate; and when Caustic Alkali and Glycerine are both present, even Alkaline Sulphides will not give a precipitate.

(Austr. and Hung., Hydrargyrum Bichloratum Corrosivum; Belg., Sublimatus Corrosivus; Dan., Norw. and Swed., Chloretum Hydrargyricum Corrosivum: Dutch, Chloretum Hydrargyricum; Fr., Chlorure Mercurique;

Ger., Russ. and Swiss, Hydrargyrum Bichloratum; Ital., Bichloruro di Mercurio; Port., Chloreto Mercurico; Span., Cloruro Mercurico; U.S., Hydrargyri Chloridum Corrosivum.)

**Medicinal Properties.**—A powerful irritant, given in very small doses in syphilitic affections. Externally as a **lotion**, 1 grain to the ounce, or **ointment**, 2 to 8 grains in the ounce, in chronic skin diseases, as an **injection**, 1 grain to 8 ounces, for chronic mucous discharges, and as a **gargle**, 1 grain in 4 ounces, for ulcerated sore throat; as a **collyrium**, 1 grain in 8 ounces. By **hypodermic injection,** $\frac{1}{30}$ to $\frac{1}{10}$ grain (with Chloride of Sodium), in divided portions in the course of the day.

In France it is legal to supply registered nurses (for obstetric purposes) with a lotion containing ·025 grm. Perchloride of Mercury and 1 grm. Tartaric Acid per litre, also an ointment containing 1 per cent. Perchloride in Vaseline.—*A.J.P.* '90, 180.

An **aqueous solution** 1 in 10,000 is a reliable agent for the destruction of micrococci and bacilli in active growth not containing spores; and 1 in 1,000 destroys the spores if allowed sufficient time, and can be used for washing floors, bedding, clothing, instruments, superficial wounds, and mucous surfaces. For continual application to wounds 1 in 10,000; 1 in 500 with the same percentage of Permanganate of Potassium can be used for pouring on fæcal discharges, and should be left in contact for two hours.—*L.* '85, i. 721.

Dr. Hulbert of St. Louis, stated that he had salivated five patients with a solution 1 in 3,000 given as a vaginal douche twice a day.—*L.* '85, i. 677.

Recommended for dysentery in India, $\frac{1}{175}$ gr. every 4 hours.—*L.* '89, ii. 901.

*Is a powerful hepatic, but a feeble intestinal stimulant.*

*When Calomel and Perchloride of Mercury are given together, both the liver and intestinal glands are stimulated.—Dr. Rutherford.*

**Dose.**—$\frac{1}{16}$ to $\frac{1}{8}$ gr.

**Incompatibles.**—Alkalies and their Carbonates, Lime Water, Tartar Emetic, Nitrate of Silver, Acetate of Lead, Albumen, Iodide of Potassium, Soaps, Decoction of Bark, Tannin, alkaline Sulphurets.

**Antidotes.**—In case of poisoning by Corrosive Sublimate, if vomiting does not already exist, it must be excited by the use of an Emetic; both the yolk and white of egg mixed with water may be administered in large quantity; wheaten flour with milk has also been recommended.

## Preparations.

### LIQUOR HYDRARGYRI PERCHLORIDI.

Perchloride of Mercury, 10 grs.; Chloride of Ammonium, 10 grs.; Distilled Water, 20 oz.: dissolve. =(1 in 875).

Each fluid drachm is equal to $\frac{1}{16}$ grain of Perchloride.

It forms the more soluble double Chloride of Mercury and Ammonium, Sal Alembroth (*see* p. 302).

**Dose.**—30 to 120 minims.

(Belg., Liquor Sublimati Corrosivi (Van Swieten); Fr., Soluté de Bichlorure de Mercure; Ital., Soluzione Idroalcoolica di Bicloruro di Mercurio; Port., Soluto de Chloreto Mercurico; Swiss, Hydrargyrum Bichloratum Solutum: all 1 in 1000; Span., Solucion Hidro-Alcoholica de Cloruro Mercurico, 1 in 1200. Not in the others.)

### LOTIO HYDRARGYRI FLAVA.

Perchloride of Mercury, 18 grs.; Solution of Lime, 10 oz.: mix. =(1 in 243).

This lotion owes its efficacy to the precipitated Mercuric Oxide.

(Aq. Phagedænica.—Belg. and Dutch, 1 in 250; Fr. (Eau Phagédénique), 1 in 300; Span. (Agua Fagedenica), 1 in 350. Not in the others.)

### Not Official.

**CORROSIVE SUBLIMATE DISCS.**—Compressed discs containing $8\frac{3}{4}$ grains of Perchloride of Mercury with an equal weight of Chloride of Sodium, and coloured with Methyl Violet.

One disc dissolved in a pint of water forms a solution containing 1 in 1,000 of Perchloride.

One pint of London Water with 10 grains of Perchloride of Mercury makes a clear solution, also with the addition of 10 grains of Chloride of Sodium; but with 10 grains of Chloride of Ammonium it is very turbid. The latter, therefore, should not be used in making the discs.

**SUBLIMATE WOOD WOOL.**—Pinewood reduced almost to a state of powder containing $\frac{1}{2}$ per cent. of Corrosive Sublimate. It is highly absorbent.

**SAL ALEMBROTH.**—The Double Chloride of Mercury and Ammonium, $2NH_4Cl.HgCl_2,H_2O$; when exposed to dry air the water is given off.

**Solubility.**—2 in 1 of Water, 1 in $3\frac{1}{2}$ of Rectified Spirit, 1 in 1 of Glycerine.

**Medicinal Properties.**—A powerful antiseptic, but it is not so irritating as Corrosive Sublimate. Used in the antiseptic treatment of wounds.

For **hypodermic** injection in syphilis, $\frac{1}{3}$ grain dissolved in 10 minims of Water.—*B.M.J.* '88, i. 905.

Alembroth **Gauze**, 1 per cent.; **Wool**, 2 per cent.

**HYDRARGYRUM CARBOLICUM** (*Schadek*).—Colourless crystals, or a white powder. Obtained by precipitating an alcoholic solution of Mercuric Chloride with an alcoholic solution of Phenol and Caustic Potash, and evaporating nearly to dryness, with subsequent washings.

Nearly insoluble in Water, and soluble with difficulty in cold Alcohol.

**Medicinal Properties.**—Recommended in secondary syphilis.—*L.* '87, i. 943; *L.* '87, ii. 277; *P.J.* xviii. 605.

**Dose.**—$\frac{1}{3}$ to $\frac{1}{2}$ grain three times a day in **pill**; also **hypodermically**, suspended in Mucilage, strength 2 per cent.

**PILULA HYDRARGYRI CARBOLICI.**—Carbolate of Mercury, $\frac{1}{3}$ gr.; Extract of Liquorice, 1 gr.; Powdered Liqourice, 1 gr., in each pill.

**Dose.**—Two to four pills daily.

## HYDRARGYRI PERSULPHAS.

### PERSULPHATE OF MERCURY.

*B.P.Syn.*—Hydrargyri Sulphas; Sulphate of Mercury; Mercuric Sulphate.

$HgSO_4$, eq. 296.

A white, heavy, crystalline powder, prepared (B.P.) by dissolving Mercury in strong Sulphuric Acid and evaporating to complete dryness.

It is decomposed by water, forming a yellow oxysulphate called Turpeth Mineral, $HgSO_4.2HgO$, and free Sulphuric Acid.

It is used for working small medical batteries.

Entirely volatilised by heat, but not below redness.

(Fr., Sulfate Mercurique; Sulfato Mercurico, Port. and Span.; not in the others; Belg., Subsulphas Hydrargyri; Swiss, Hydrargyrum Sulfuricum basicum; U.S., Hydrargyri Subsulphas Flavus; these three are the yellow "Turpeth Mineral.")

Used to prepare Subchloride and Perchloride of Mercury.

### Not Official.

**UNGUENTUM HYDRARGYRI SULPHATIS FLAVÆ** (*B.S.H.*).—Yellow Sulphate of Mercury, 15 grains; Benzoated Lard, 1 oz. Mix.

Useful in ringworm and seborrhœa capitis.

## HYDRARGYRI SUBCHLORIDUM.

### SUBCHLORIDE OF MERCURY.

*B.P.Syn.*—CALOMELAS (1864, Edin. Dub.); HYDRARGYRI CHLORIDUM (Lond.); CALOMEL; MERCUROUS CHLORIDE.

**HgCl**, eq. 235·5.

A dull-white, heavy, and nearly tasteless powder. It is prepared (B.P.) by triturating Persulphate of Mercury with an equivalent of Metallic Mercury and subliming the Subsulphate (thus formed) with Chloride of Sodium. The sublimed Calomel is freed by washing from any trace of Corrosive Sublimate.

Insoluble in Water, Rectified Spirit, or Ether.

**Tests.**—Digested with Solution of Potash it becomes black, and the clear solution acidified with Nitric Acid, gives a copious white precipitate with Nitrate of Silver. Contact with Hydrocyanic Acid also darkens its colour. Entirely volatilised by a sufficient heat—indicating absence of fixed impurities. Warm Ether, which has been shaken with it in a bottle, leaves on evaporation no residue—indicating absence of Corrosive Sublimate.

This evaporation must be performed at a low temperature, otherwise the Corrosive Sublimate (if present) will volatilise in the Ether vapour.

(Belg., Calomelas; Dan., Calomel; Fr., Protochlorure de Mercure par volatilisation, also Chlorure Mercureux Précipité; Dutch, Chloretum Hydrargyrosum; Norw., Chloretum Hydrargyrosum Mite; Swed., Chloretum Hydrargyrosum Precipitatum; Austr. and Hung., Hydrargyrum Chloratum Mite, both the levigated and that sublimed in steam; Ger. and Swiss, Hydrargyrum Chloratum, also Hydrargyrum Chloratum vapore paratum; Ital., Protochloruro di Mercurio; Port., Chloreto Mercuroso, also Mercurio Doce; Russ., Hydrargyrum Chloratum Levigatum, also Hydrargyrum Chloratum Vapore præparatum; Span., Cloruro Mercurioso (Sublimado, Por el Vapor, and Precipitado); U.S., Hydrargyri Chloridum Mite.)

The following synonyms are applied to Calomel obtained by precipitation:—Fr., Précipité Blanc; Port. and Span., Precipitatum Album. These terms do not mean, as in England, Ammoniated Mercury.

**Medicinal Properties.**—Alterative, cholagogue, and purgative.

*Calomel stimulates the intestinal glands, but not the liver.—Dr. Rutherford.*

It is probable that the cholagogue action of Calomel is due to its having a peculiar stimulant action on the duodenum and ileum, so as to hurry the bile along the intestine and prevent its re-absorption.—*Lauder Brunton.*

As an alterative it is used in syphilitic affections, chronic skin diseases, and scrofula in adults.

Useful in chronic hepatitis and jaundice.

As a purgative in bilious headache, hepatic dropsy, melæna, inflammation of the brain, and apoplexy.

As an antiphlogistic, 2 grs. combined with ¼ gr. Opium, every four hours in inflammation of the serous membranes—*e.g.*, pleurisy; also in iritis.

For children, the absence of taste renders it convenient.

Its *local uses* are numerous, as in **snuff**, or as a **gargle** in venereal sore throat, as an **injection** with or without Lime Water, in blenorrhœa, and in **fumigation**; for this latter purpose a spirit lamp under a metal cup containing Calomel, is placed under a cane-seated chair on which the patient is seated, his body being covered with a blanket; an apparatus contrived by Mr. Lee is still better. In a wide range of skin affections, it is invaluable as an **ointment.**

Should not be applied to the eye when a patient is taking Iodide of Potassium, for it will cause severe inflammation.—*M.P.* '80, ii. 294.

**B.P.Dose.**—½ to 5 grs.

Calomel can be made into **pills** with Glucose, and if the pills be too small, they can be made larger by the addition of Sugar of Milk.

**Incompatibles.**—Bromides and Iodides, Nitro-Hydrochloric Acid, Hydrocyanic Acid, Alkaline Chlorides. Soap, even when neutral. Solutions of Lime, Potash, or Soda.

## Preparations.

### LOTIO HYDRARGYRI NIGRA. *N.O.Syn.*—Black Wash.

Subchloride of Mercury, 3 grs.; Solution of Lime, 1 oz.: mix. =(about 1 in 146).

The Black Suboxide produced in this preparation gradually oxidises to Mercuric Oxide and becomes yellow. This change may be prevented by the addition of Glycerine 1 drm. to a pint.—*P.J.* xx. 517.

Useful application to syphilitic sores.

(Not now in the other Pharmacopœias.)

### PILULA HYDRARGYRI SUBCHLORIDI COMPOSITA.

*B.P.Syn.*—Pilula Calomelanos Composita. *N.O.Syn.*—Plummer's Pill.

Subchloride of Mercury, 1; Sulphurated Antimony, 1; Guaiacum Resin in powder, 2; Castor Oil, 1, or sufficient to form a pill mass: mix. =(1 in 5).

**Dose.**—5 to 10 grs.

(Belg. (Pil. Plummeri), 1 in 3; U.S. (Pil. Antimonii Comp.), 1 in 4. Not in the others.)

### UNGUENTUM HYDRARGYRI SUBCHLORIDI.

Subchloride of Mercury, 80 grains; Benzoated Lard, 1 oz.: mix. =(about 1 in 6½).

Useful in the itching of some skin affections, psoriasis and eczema, also in pruritus ani. A good application to scrofulous sores.

(Fr. (Pommade de Chlorure Mercureux), 1 in 10; Port. (Pomada de Mercurio Doce), 1 in 10; Span. (Pomada de Cloruro Mercurioso), 2 in 17; not in the others.)

Not Official.

**EMPLASTRUM CALOMELANOS.**—*Syn.*—Emplastrum Album.—Contains 20 per cent. of Calomel, spread on silk or other suitable material.

**PILULA CALOMELANOS C. COLOC.**—Calomel, 1 gr.; Comp. Extract Colocynth, 3½ grs.; Ipecacuanha, ½ gr.; in two pills.—*Middlesex Hospital.*

**PILULA CALOMELANOS C. JALAPA.**—Calomel, 1 gr.; Jalap, 3 grs.; Treacle, *q.s.*: in one pill.—*St. Bartholomew's Hospital.*

**PILULA CALOMELANOS C. SCAMMONIO.**—Calomel, 1 gr.; Scammony, 3 grs.; Treacle *q.s.*; in one pill.—*St. Bartholomew's Hospital.*

Not Official.

### HYDRARGYRI TANNAS.

A greyish-green or blackish-grey powder, containing 40 to 50 per cent. of Mercury.

It is decomposed by Water and solutions of the Alkalies. It is not materially affected by Diluted Hydrochloric Acid.

(Austr. contains about 42 p. c. of Mercury; not in the others.)

**Medicinal Properties.**—Has been found very useful in syphilis.

It is decomposed by the Alkali of the intestines, and the Mercury rapidly passes into the system.—*L.* '84, i. 723, *M.T.* '85, ii. 869.

**Dose.**—1 to 2 grains in a **pill,** 3 times a day, an hour before meals.

## HYDRARGYRUM AMMONIATUM.

### AMMONIATED MERCURY.

*B.P.Syn.*—Hydrargyri Ammonio-Chloridum; Hydrargyri Præcipitatum Album; Chloride of Mercuric-Ammonium.

$NH_2HgCl$, eq. 251·5.

An opaque white powder prepared by precipitating a solution of Corrosive Sublimate with Ammonia.

It is known as *infusible white precipitate.*

The *fusible* variety is obtained by adding a solution of Mercuric Chloride to a mixture of Ammonium Chloride and Ammonia till the precipitate ceases to redissolve. It has the formula $HgCl_2.2NH_3$.

**Solubility.**—Soluble in Hydrochloric Acid. Insoluble in Water, Alcohol, and Ether.

**Tests.**—Entirely volatilised at a heat below redness. Digested with Caustic Potash, it evolves Ammonia, acquiring a pale yellow colour, and the fluid, filtered and acidulated with Nitric Acid, gives a white precipitate with Nitrate of Silver. It should yield 77·5 per cent. of Metallic Mercury.

(Austr. and Hung., Hydrarg. Bichloratum Ammoniatum; Belg., Præcipitatum Album; Dan. Chloretum Amido-hydrargyricum; Dutch, Chloretum Hydrargyrico-ammonicum; Ger., Hydrargyrum Præcipitatum Album; Ital., Cloramiduro di Mercurio; Norw. and Swed., Chloretoamidetum Hydrargyricum; Russ. and Swiss, Hydrargyrum Amidato-bichloratum; U.S., Hydrargyrum Ammoniatum; Ph. Lond. 1788, Calx Hydrargyri Alba; not in Fr., Port. or Span.)

The synonyms, Fr., Précipité Blanc; Port. and Span., Precipitatum Album; apply to Calomel and *not* to Hydrargyrum Ammoniatum.

**Medicinal Properties.**—Never given internally. Used in the form of ointment as a stimulating application for chronic skin diseases, impetigo, herpes, and sometimes scabies. The ointment is used for pediculi, but the powder can be used alone or mixed with Rose Water, and the unpleasantness of greasing the linen avoided.

**Antidotes.**—Stomach-pump or an emetic; unboiled white of egg mixed with Water, Flour and Water, Barley Water. Stimulants: Brandy, Chloric Ether, Spirit of Sal Volatile.

### Preparation.

**UNGUENTUM HYDRARGYRI AMMONIATI.** *B.P.Syn.*—OINTMENT OF WHITE PRECIPITATE.

Ammoniated Mercury, 1; Simple Ointment, 9: mix. =(1 in 10).

(Dutch, Ung. Chloreti Hydrargyrico-ammonici, 1 in 10; Ger. and Swiss, Ung. Hydrargyri Album, and Russ., Ung. Hydrargyri Amidato-bichlorati, 1 in 10; U.S., 1 in 10; not in the others.)

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## HYDRARGYRUM CUM CRETA.

### MERCURY WITH CHALK.

*N.O.Syn.*—GREY POWDER.

Mercury (by weight), 1; Prepared Chalk, 2: triturate till the globules disappear. =(1 in 3).

A powder of a light-grey colour. Free from grittiness.

Twelve commercial samples examined contained Mercury 21·2 to 35·8 p.c. (and one sample, taken from the bottom of a stock bottle, gave as much as 49·6 p.c., probably owing to the Mercury having shaken down); Mercurous Oxide from a trace to 6 p.c.; Mercuric Oxide from ·65 to 4·6 p.c. The best sample gave 30·3, ·17, and ·65 p.c. respectively.—*P.J.* xv. 230.

Instead of the 2 of Chalk, 1½, with ½ of Sugar of Milk, is recommended.—*P.J.* March, 1860, and again *P.J.* vi. 1034.

Carbonate of Magnesia as a substitute for Chalk is recommended.—*C.D.* '84, 549.

U.S., rubs the Mercury with Honey and Water previous to adding the Chalk.

**Insoluble** in Water.

**Test.**—When treated with Diluted Hydrochloric Acid, part is dissolved, leaving the Mercury in a finely divided state; the solution is not precipitated with Stannous Chloride (Mercuric Oxide).

(Swed., same as Brit.; Port., Mercurio com Carbonato de Cal, 3 in 10; U.S., 3·8 in 10; not in the others.)

**Medicinal Properties.**—Chiefly given to children in diarrhœa and vomiting, also in tonsillitis and mumps.

Best given by itself, or with Rhubarb or other powder; but when required to be made into **pills,** Glucose is the best excipient.

**Dose.**—3 to 8 grs.

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# HYDRASTIS RHIZOMA.

## HYDRASTIS RHIZOME.

*B.P.Syn.*—Golden Seal.

The dried rhizome and rootlets of *Hydrastis Canadensis.*

Hydrastis contains at least two alkaloids—**Berberine** (about 4 p. c.) and **Hydrastine** (about 1½ p. c.).

Hydrastine is distinguished from Berberine by giving *no* red colour with Chlorine Water.

(Austr., Dan., Dutch, Ger., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.** — Tonic, astringent, stomachic, and cholagogue.

Recommended in uterine hæmorrhage.—*L.* '85, ii. 733; '87, i. 391; '87, ii. 1287; '88, i. 868; '88, ii. 133; *B.M.J.* '87, ii. 1349: '88, ii. 123.

In dyspepsia.—*L.* '85, ii. 885. Used locally in chronic pharyngitis.—*L.* '89, i. 549.

### Preparations.

### EXTRACTUM HYDRASTIS LIQUIDUM.

Moisten 20 of Hydrastis Rhizome in No. 60 powder with 8 of a mixture of Rectified Spirit and Distilled Water equal parts; pack it in a percolator and pour on sufficient of the menstruum to saturate it thoroughly. When the liquid begins to drop, close the lower orifice and macerate for forty-eight hours; then proceed with the percolation until the drug is exhausted. Reserve the first 17 of percolate; evaporate or distil off the Spirit from the remainder, and evaporate the residue to a soft extract; dissolve this in the reserved portion and add enough menstruum to make the liquid measure 20. =(1 in 1).

**Dose.**—5 to 30 minims.

Dan., Dutch, Ger., Ital., Russ., Swiss and U.S., all 1 in 1; Austr., 2 in 3; not in the others.)

Dr. Shoemaker has used the fluid extract as a stimulant and astringent application in skin diseases.—*L.* '85, ii. 87.

### TINCTURA HYDRASTIS.

Macerate 2 of Hydrastis Rhizome in No. 60 powder with a suitable quantity of Proof Spirit, and macerate for 24 hours; pack in a percolator, and gradually add Proof Spirit until 20 of tincture is obtained.

**Dose.**—20 to 60 minims. =(1 in 10)

(U.S., 1 in 5; not in the other Pharmacopœias.)

### Not Official.

**HYDRASTIN.**—An eclectic remedy has been sold under this name for many years. It is said to consist principally of Muriate of Berberine, with some Hydrastine.

*It is a moderately powerful stimulant of the liver and a feeble stimulant of the intestines.* —*Dr. Rutherford.*

**HYDRASTINA.**—An alkaloid ($C_{21}H_{21}NO_6$) crystallising in white prisms. Taste bitter and pungent. "Hydrastine Cryst." melts at 132° C.

**Solubility.**—1 in 120 of Alcohol, 1 in 83 of Ether, 1 in 2 of Chloroform, and 1 in 16 of Benzene, which last three solvents do not dissolve Berberine; nearly insoluble in Water.

**HYDRASTINÆ HYDROCHLORAS.**—Hydrochlorate of Hydrastine (not Berberine)—Faintly yellow semi-crystalline powder.

**Solubility.**—Readily in Water and in Rectified Spirit (about 1 in 1 of either).

NOTES.—*P.J.* xv. 297; xvii. 427.

Has been used as an ecbolic in pregnancy; maximum daily dose, 5 grains.—*L.* '86, i. 990.

**HYDRASTININE.**—An oxidation product ($C_{11}H_{11}NO_2$) of the natural alkaloid Hydrastine. It is crystalline, and has a melting point 116°—117° C. Not readily soluble in Water.

**HYDRASTININÆ HYDROCHLORAS.**—A pale yellow crystalline powder. Soluble in its own weight of Water, 1 in 3 of Rectified Spirit.

**Medicinal Properties.**—A cardiac stimulant, produces strong contraction of the smaller blood vessels.

Useful in endometritis, and uterine fibroid, in which excessive bleeding is a prominent symptom.—*L.* '90, i. 712; *T.G.* '90, 86; '92, 539, 699; *Pr.* xlv. 373. Valuable in metrorrhagia.—*L.* '92, ii. 1350.

**Dose.**—$\frac{3}{4}$ to $1\frac{1}{2}$ grains, used **hypodermically** in a 10 per cent. aqueous solution.

Not Official.

## HYDROGENII PEROXIDUM.

$H_2O_2$.

In its purest condition this is a colourless liquid. Sp. g. 1·452, evolving when heated 475 times its volume of oxygen gas. It is obtained by decomposing Peroxide of Barium with Sulphuric Acid, and concentrating the filtered liquid in vacuo over Sulphuric Acid. Commercially it is sold containing 10 or 20 volumes of available oxygen, at which strength it is permanent at ordinary temperatures. It is one of the most powerful oxidising agents known, and is used for bleaching hair and delicate fabrics which might be injured by Chlorine.

Dr. Richardson has recommended its use in 5 volume solution as a deodorising **gargle** in scarlet fever, and the following **mixture** in whooping-cough:—Hydrogen Peroxide (10 vols.), 6 drms.; Glycerine, 4 drms.; Water to 3 oz. Dose: Half a fluid ounce in a wineglassful of Water 5 or 6 times a day.—*Asclepiad* '87, 53.

(Ital., Acqua Ossigenata, 12 volumes; U.S., Aqua Hydrogenii Dioxidi, 10 volumes; not in the others.)

## HYOSCYAMI FOLIA.

HENBANE LEAVES.

The fresh leaves and flowers, with the branches to which they are attached, of the indigenous biennial plant *Hyoscyamus niger*, Henbane; collected from wild or cultivated plants growing in Britain when about two-thirds of the flowers are expanded. Also the leaves and flowering tops, carefully dried.

The biennial plant in the first year presents only a tuft of leaves; these die, and leave not a trace of the plant above ground in the winter; about April the plant grows and produces a stem, the leaves and branches of which are used in medicine.

It has been shewn by Gerrard (*P.J.* xxi. 212) that carefully dried leaves from either—(1) Annual Henbane; (2) Biennial Henbane, first year's growth; (3) Biennial Henbane, second years' growth; scarcely differ in their alkaloidal strength, so that the Official restriction to the third variety mentioned above may possibly be removed. (*See also P.J.* xxi. 312).

"Annual" Henbane is not much grown in this country, but considerable quantities of dried leaves are imported from abroad.

There is some evidence that dried leaves deteriorate on keeping, but this has not been satisfactorily demonstrated.

The percentage of total alkaloid in Henbane leaf dried at 212° F. is ·06 to ·07, or about $\frac{1}{8}$ that contained in Belladonna.

Its properties are completely extracted by Alcohol. The leaves yield by destructive distillation a very poisonous Oil. From the plant are obtained the crystallisable alkaloids **Hyoscyamine** and **Hyoscine**; the latter until lately has been regarded as uncrystallisable.

(Austr., Dutch, Ger., Hung., Ital. (Giusquiamo), Swed., Swiss and U.S., **Leaves**; Belg., Dan., Fr. (Jusquiame noire), Norw., Port. (Meimendro), Russ. and Span. (Beleno), **Leaves** and **Seeds.**)

**Medicinal Properties.**—Narcotic. Similar in action to Belladonna and Stramonium, but milder. Used as a sedative in excited states of the nervous system when Opium, from its constipating properties, is not advisable. It is also employed to diminish pain and allay irritation of the bladder, and to prevent the griping of purgative medicines. The juice is sometimes used as a cataplasm, or as a fomentation to allay pain in ulcers and tumours, and in gouty and rheumatic swellings. It dilates the pupil of the eye.

**Incompatibles.**—Vegetable Acids, Nitrate of Silver, Acetate of Lead, Liquor Potassæ or Sodæ.

**Antidotes.**—The same as for Atropine.

## Preparations.

### EXTRACTUM HYOSCYAMI.

The expressed juice of the leaves, flowering tops, and young branches of the fresh plant treated as directed in Extract of Belladonna, and evaporated to an extract at a temperature not exceeding 140° F. (60° C.).

100 lbs. Leaves produced 50 lbs. juice = 5 lbs. Extract.

100 lbs. Leaves, dried, weighed 15½ lbs.

100 lbs. freshly-picked Leaves, when dried, yielded only 11 lbs.

**B.P. Dose.**—5 to 10 grs., but it is generally used in smaller doses in **pills** to qualify the action of aperients.

(Austr., alcoholic from **dried Leaves**; Belg., juice from **fresh Leaves,** evaporated and mixed with an equal quantity of alcohol, filtered and evaporated; Dan., Norw., and Swed., made from **Leaves** with weak Spirit; Dutch, alcoholic from **fresh herb**; Fr., clarified juice from **fresh Leaves** evaporated, also alcoholic extract from the **Seeds**; Ger., made with Water and Spirit from **fresh herb**; Hung., juice from **fresh Leaves,** freed from Albumen and evaporated to a thick fluid, equal parts of Spirit added, filtered and again evaporated; Ital., from **dried Leaves** with dilute Alcohol; Port., Aqueous from **dried Leaves,** also from **fresh Leaves** with Alcohol; Russ., made from **Leaves** with Water and Spirit; Span., clarified juice from **fresh Leaves,** also aqueous from **dried Leaves,** also alcoholic from **dried Leaves;** Swiss, from **dried Leaves** with dilute Spirit, 1 = 2 of Leaves, also **Fluid Extract,** 1 in 1; U.S., alcoholic extract from the **dried Leaf,** also **Fluid Extract** from the same.)

### SUCCUS HYOSCYAMI.

Freshly expressed juice, 3; Rectified Spirit, 1: mix and set aside seven days, then filter. Keep in a cool place.

**Dose.**—½ to 1 drm.

### TINCTURA HYOSCYAMI.

Henbane leaves or flowering tops in No. 20 powder, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of the Spirit, pack in a percolator, and when it has drained pour on the remaining Spirit, and when it ceases to drop, press, filter, and add Proof Spirit to make 8. =(1 in 8).

**B.P. Dose.**—30 to 60 minims; much larger doses, 4 drms., have been given in severe insomnolence.

(Belg. and Port., 1 and 5, also fresh herb and Alcohol equal weights; Fr., 1 and 5, also Ethereal, 1 and 5 of Ether, sp. g. ·758, and Alcoolature with fresh Leaves and Spirit, equal weights; Span., 1 and 5; U.S., by percolation, 15 in 100; all by weight except U.S.; not in the others.)

### Not Official.

**HYOSCYAMI RADIX.**—The dried root of Hyoscyamus Niger (biennial) collected in the spring. Introduced by the Author in 1878.

Contain on the average, about ·15 per cent. of total alkaloid.

**CHLOROFORMUM HYOSCYAMI.**—Hyoscyamus Root, in powder, 20; Chloroform sufficient to percolate, 20.

**LINIMENTUM HYOSCYAMI.**—Hyoscyamus Root, in powder, 30; Rectified Spirit, 20; digest 4 days, and pack in a percolator; add Rectified Spirit sufficient, with 1 of Camphor, to percolate 30.

**LINIMENTUM HYOSCYAMI COMP.**—Liniment. Hyoscyami, 7; Chloroform. Hyoscyami, 1: mix.

The Compound Liniment has been found most useful in relieving rheumatism. It is applied on piline as directed for Lin. Bellad. Comp., but is a much weaker preparation.

**TINCTURA HYOSCYAMI RADICIS.**—Hyoscyamus Root, in powder, 5; Proof Spirit, 40: digest 7 days.

**Dose.**—20 to 60 mins.

Dr. Gee, of St. Bartholomew's Hospital, tried the effect of Tincture made from the fresh and dried leaves, from the seeds, and from the dried root; he found that made from the root the most active; he has also tried Hyoscyamine—1/15 of a grain injected subcutaneously never fails to produce in a strong man great giddiness, dryness of the mouth and throat, and acceleration of the pulse in a quarter of an hour.

**HYOSCYAMINA** ($C_{17}H_{23}NO_3$).—An Alkaloid obtained from the seeds of *Hyoscyamus niger*, the root of *Scopola carniolica*, and probably other allied plants, isomeric with Atropine but not identical with it.

It **crystallises** in silky needles. Melts at 108·5° C. Only slightly soluble in Water, but freely in Alcohol, Chloroform, and Ether.

Probably constitutes the greater portion of the alkaloid naturally existing in all the mydriatic drugs, and best obtained from the root of Scopola or Belladonna. Most of the commercial "Atropine" consists principally of Hyoscyamine.

An **amorphous** Hyoscyamine also occurs in commerce as a thick syrupy liquid, the dose of which is stated to be about the same as the crystalline. It would appear that in 1884 (*Pr.* xxxvi. 321) the amorphous was mainly composed of Hyoscine; but we think this cannot be so at the present time, seeing that the dose of Hyoscine is only $\frac{1}{10}$ that of Hyoscyamine.—See Merck's Bulletin, Nov. and Dec., 1889, pp. 86, 96.

Hyoscyamine is converted into Atropine under the influence of a fixed alkali at the ordinary temperature; Ammonia also affects the alteration, but only very slowly. —*P.J.* xviii. 1048.

The same change takes place tolerably easily by simply heating to 110° C.

Conversely Atropine is re-convertible into Hyoscyamine.

As it is only slightly soluble in Water the Sulphate should be ordered when required in aqueous solution.

(Fr.; not in the other Pharmacopœias.)

**HYOSCYAMINÆ SULPHAS.**—Occurs in minute crystals which are readily soluble in Water.

They have the formula $(C_{17}H_{23}NO_3)_2.\ H_2SO_4.2H_2O$, and a melting point, 201° C. —*P.J.* xxiii. 201.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—In small doses it is a sedative for general restlessness and excitement, and in large doses it has been used for calming the excitement of acute mania, but for this purpose it is superseded by the Salts of Hyoscine.

**Dose.**—$\frac{1}{120}$ grain every half-hour or hour in asthma.—*L.* '87, ii. 368.

$\frac{1}{6}$—$\frac{1}{4}$ grain in delirium tremens.—*L.* '85, i. 346. $\frac{1}{100}$ grain in chorea.—*T.G.* '86, 120. Toxic effects.—*B.M.J.* '88, ii. 421, 667; *T.G.* '87, 51.

**HYOSCINA.**—This name was first applied by Ladenberg to a decomposition product of Hyoscyamine, but when this was found to be identical with Tropine obtained from Atropine, he transferred the name to an amorphous alkaloid contained in the mother liquors from Hyoscyamine, and which he also stated to be isomeric with Atropine. Schmidt, however, has recently discovered that this alkaloid is really identical with a crystalline alkaloid isolated from a species of Scopola, and to which the name Scopolamine has been given. It is not an isomer of Atropine, having the formula $C_{17}H_{21}NO_4.H_2O$, and Schmidt suggests that the commercial salts of the base which have been used under the name of Hyoscine, should be henceforth known as Scopolamine (*P.J.* xxii. 1021); but Hesse, while corroborating the change in formula, strongly advocates the retention of the old name of Hyoscine (*P.J.* xxiii. 223). It is usually employed medicinally in the form of **Hydrobromate**, which is readily soluble in Water, as is also the **Hydrochlorate** and **Hydriodate**.

**HYOSCINÆ HYDROBROMAS.**—The air-dried salt has the formula $C_{17}H_{21}NO_4$, $HBr.3H_2O$. (*P.J.* xxiii. 221). Readily soluble in Water, but insoluble in strong Alcohol.

(Ger., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Highly recommended in all forms of violent mania and cerebral excitement.—*L.* '90, i. 718; '90, ii. 414; '91, ii. 433; *B.M.J.* '91, ii. 694.

**Dose.**—$\frac{1}{250}$ to $\frac{1}{100}$ grain carefully increased to $\frac{1}{75}$ grain, by **hypodermic injection** or by the mouth.

**GUTTÆ HYOSCINÆ** (*L.O.H.*).—Hydrobromate of Hyoscine, 2 grains; Distilled Water, 1 oz. Dissolve.

A rapid, powerful, and unirritating dilator of the pupil. Its use is not accompanied by the dryness of the throat that so commonly follows the use of Atropine.—*L.* '86, ii. 1065.

**INJECTIO HYOSCINÆ HYPODERMICA.**—A convenient solution is made by dissolving Hydrobromate of Hyoscine, 1 grain, in Distilled Water, 500 minims, but the strength should always be indicated by the prescriber.

**Dose.**—2 to 5 minims as a sedative in nervous diseases, especially where there is much violence and excitement. When given by the mouth at least double the dose is required to produce the same effect.—*L.* '89, ii. 736.

**Antidote.**—Pilocarpine Nitrate, half a grain hypodermically, and repeated if necessary. Chloral Hydrate has also been used.

### Not Official.

## ICHTHYOCOLLA.

### ISINGLASS.

The swimming bladder or sound of various species of *Acipenser* prepared and cut into fine shreds.

This is included among the tests of the British Pharmacopœia, its solution being used for Tannic Acid, with which it forms an insoluble compound.

This well-known substance was in the early London Pharmacopœias, and called Ichthyocolla or Fish glue; it was used in medicine as a nutrient. It is still to be found in most of the Continental Pharmacopœias. It is used for fining Wine, for which purpose Gelatine does not answer. Russian Isinglass is reckoned the best quality.

(Austr., Belg., Fr., Hung. and U.S.; Dan., Ital. and Russ., Colla Piscium; Port., Gelatina de Peixe; Span., Ictiocola; not in the others.)

Isinglass is used for Court Plaster and gold-beater's skin.

**Test.**—Isinglass is not soluble in cold water; Gelatine is. (Dr. Aquilla Smith.)

Isinglass 15 grs. to the oz. of Glycerine. Useful in some skin diseases.

### Not Official.

## ICHTHYOL.

### SULPHO-ICHTHYOLATE OF AMMONIUM.

It is obtained by the action of Sulphuric Acid on a mineral oil distilled from peculiar fossil deposits, principally fish, and subsequent neutralisation with Ammonia.

A reddish-brown syrupy liquid with igneous bituminous odour and taste. Treated with Potash Solution it develops an odour of Ammonia. When dried in a water-bath it loses at least half its weight.

**Solubility.**—Entirely soluble in Water, partly soluble in Alcohol and Ether, entirely in a mixture of both.

It mixes readily with Glycerine, Fats, Oils, Soft Paraffin, and Lanoline.

**Medicinal Properties.**—It is stated to have remarkable effects in eczema. May be mixed with Soft Paraffin or Lard in the proportion of 20 to 30 per cent. decreased to 10 per cent. for moist eczema, and 50 per cent. reduced to 20 per cent. for the papular condition. The hand requires a stronger preparation than the face, and children a weaker one than adults. It is also used in acne rosacea, and lichen urticaria. (It is not indicated in psoriasis.) It is also applied in rheumatism.

Internally it has been given for eczema, also in acute and chronic rheumatism, and in chronic catarrh of the stomach and intestines.—*L.* '83, i. 334, *B.M.J.* '87, i. 800.

The following formula is recommended for eczema:—Litharge, 10; Diluted Acetic Acid, 30: boil down to 20, add Olive Oil, Lard, and Ichthyol of each 10, all by weight, to make an **ointment.**—*L.* '83, i. 334. It is better to boil down to 13, as Water separates from the Ointment if evaporated only to 20 as directed.

Found useful in every variety of eczema as 5 to 10 per cent. Ointment.—*B.M.J.E.* '93, ii. 68.

In rheumatism (*L.* '86, ii. 645); in traumatic erysipelas (*L.* '87, i. 191); as an application in pruritus and prurigo, also for indolent ulcers (*B.M.J.* '86, i. 164).

Ichthyol modifies, and shortens the duration of, erysipelas; 30 to 50 per cent. Ointment, or 10 per cent. for sensitive skins.—*T.G.* '91, 862; '92, 294, 684.

For metritis and uterine affections.—*L.* '90, i. 1142; '91, i. 55.

It is not without danger, as an application of 1 Ichthyol and 5 Vaseline to a child four years old produced stupor for twelve hours, but it completely recovered.—*B.M.J.* '84, ii. 1013.

**Dose.**—15 to 30 grains.

It is prescribed in **pills** containing 2 grains Ichthyol; made up with a mixture of Althæa 3, Liquorice Powder 3, and Tragacanth 2.

Also in **capsules** containing 4 grains.

**Thiol** is an artificial substitute prepared from Peat-tar and Sulphur.

**NATRIUM SULPHO-ICHTHYOLICUM.**—A brownish-black tar-like mass with a bituminous odour.

(Ital. (Ittiolo) and Russ.; not in the others.)

**Solubility.**—It makes a somewhat turbid solution with Water; it dissolves in a mixture of equal weights of Alcohol and Ether; it is soluble in Benzol.

No vapour of Ammonia is evolved from the aqueous solution upon warming it with Soda Solution.

**Medicinal Properties.**—The same as the Ammonium Salt.

### Not Official.

## IGNATIA AMARA.

The seed of *Strychnos ignatii.*

(Fr., Fève de St. Ignace; Port., Fava de S. Ignacio; Span., Haba de S. Ignacio.)

**Medicinal Properties.**—Similar in action to Nux Vomica.

### Preparations.

**EXTRACTUM IGNATIÆ AMARÆ.**—Prepared by percolating Ignatia beans in fine powder, with Rectified Spirit, and evaporation.

Given in debility of the digestive organs.

**Dose.**—$\frac{1}{8}$ to 1 gr. in a **pill** three times a day.

(Not in the other Pharmacopœias.)

**TINCTURA IGNATIÆ AMARÆ.**—Ignatia beans in fine powder, 1; Rectified Spirit sufficient to percolate 10.

**Dose.**—5 to 20 minims.

(Not in the other Pharmacopœias.)

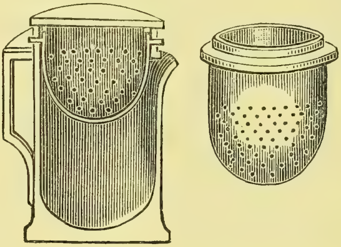
# INFUSA.

## INFUSIONS.

Infusions, though generally made with boiling water, are in some cases ordered to be made at a lower temperature, as Infusum Calumbæ, the starch of which would be dissolved by boiling water. The mucilage and vegetable albumen present are, however, dissolved by cold water, and these render the infusion liable to change.

The Infusion Pot, invented by the Author and placed in the Exhibition of 1851, answers well for Infusions, if proper sizes are used for the quantities ordered, so that the ingredients are held by the perforated basin in the upper part of the fluid and *under the surface.* The impregnated fluid becoming of greater density falls to the bottom, thus exposing the ingredients constantly to the continued action of fresh unimpregnated fluid until the action ceases, and the soluble matter is most effectually extracted. *When hot infusions are made, boiling water should be first poured into the pot, to thoroughly warm it; this being thrown out, the ingredients are put into the colander, and the requisite quantity of boiling water poured upon them. The new pots have the directions for use enamelled upon them.*

The annexed section of the Infusion Pot will show its construction:—



Concentrated Infusions are very largely used by general practitioners and some chemists; although very convenient and economical they have not the aroma of the freshly made infusion.

Infusions are very apt to change in hot weather, and several means have been proposed to preserve them. Small bottles when filled to the brim with recently made infusion, and kept at the boiling-point for five minutes, then tied over with a bladder, or stoppered whilst hot, keep well for several weeks. Inf. Gentian. Co., Inf. Aurant. Co., so treated, kept good for three months. Infusion of Senna, which would change in twelve hours in hot weather, will keep for several days perfectly good if one grain of Nitre be dissolved in each ounce of the infusion.

The following are the Infusions of the British Pharmacopœia. The full formulas for these Infusions will be found under the names of the substances from which they are prepared.

It has been thought desirable, for the convenience of the dispenser, to add a table of the ingredients and time required.

Boiling Distilled Water is to be used, unless otherwise stated.

| | | | | | | |
|---|---|---|---|---|---|---|
| INFUSUM ANTHEMIDIS | ½ oz. | | Water 10 oz. | Infuse ¼ | hour | and strain. |
| INF. AURANTII (peel cut small) | ½ oz. | | 10 | ¼ | ,, | ,, |
| INF. AURANTII COMP. | | | | | | |
| Bitter Orange Peel, cut small | ¼ oz. | | 10 | ¼ | ,, | ,, |
| Fresh Lemon Peel, cut small | 56 grs. | | | | | |
| Cloves (bruised) | 28 grs. | | | | | |
| INF. BUCHU (leaves bruised) | ½ oz. | | 10 | ½ | ,, | ,, |
| INF. CALUMBÆ (cut small) | ½ oz. | cold | 10 | ½ | ,, | ,, |
| INF. CARYOPHYLLI (bruised) | ¼ oz. | | 10 | ½ | ,, | ,, |
| INF. CASCARILLÆ (No. 20 powder) | 1 oz. | | 10 | ½ | ,, | ,, |
| INF. CATECHU (coarse powder) | 160 grs. | | 10 | ½ | ,, | ,, |
| Cinnamon (bruised) | 30 grs. | | | | | |
| INF. CHIRATÆ (cut small) | ¼ oz. | 120° F. | 10 | ½ | ,, | ,, |
| INF. CINCHONÆ ACIDUM. | | | | | | |
| Red Cinchona Bark in No. 40 powder | ½ oz. | | 10 | 1 | ,, | ,, |
| Aromatic Sulphuric Acid | 1 drm. | | | | | |
| INF. CUSPARIÆ (No. 40 powder) | ½ oz. | 120° F. | 10 | 1 | ,, | ,, |
| INF. CUSSO (coarse powder) | ¼ oz. | | 4 | ¼ | *hour,* | *not strained.* |
| INF. DIGITALIS (dried leaves) | 28 grs. | | 10 | ¼ | hour | and strain. |
| INF. ERGOTÆ (crushed) | ¼ oz. | | 10 | ½ | ,, | ,, |
| INF. GENTIANÆ COMP. | | | | | | |
| Gentian Root (sliced) | 55 grs. | | 10 | ½ | ,, | ,, |
| Bitter Orange Peel (cut small) | 55 grs. | | | | | |
| Fresh Lemon Peel (cut small) | ¼ oz. | | | | | |
| INF. JABORANDI (cut small) | ½ oz. | | 10 | ½ | ,, | ,, |
| INF. KRAMERIÆ (No. 40 powder) | ½ oz. | | 10 | ½ | ,, | ,, |
| INF. LINI . . . . Linseed | 150 grs. | | 10 | 2 | ,, | ,, |
| Dried Liquorice Root (No. 20 powder) | 50 grs. | | | | | |
| INF. LUPULI | ½ oz. | | 10 | 1 | ,, | ,, |
| INF. MATICÆ (cut small) | ½ oz. | | 10 | ½ | ,, | ,, |
| INF. QUASSIÆ (chips) | 55 grs. | cold | 10 | ½ | ,, | ,, |
| INF. RHEI (sliced) | ¼ oz. | | 10 | ½ | ,, | ,, |
| INF. ROSÆ ACIDUM (broken petals) | ¼ oz. | | 10 | ½ | ,, | ,, |
| Dil. Sulph. Acid | 1 drm. | | | | | |
| INF. SENEGÆ (No. 20 powder) | ½ oz. | | 10 | ½ | ,, | ,, |
| INF. SENNÆ . . . . . (Senna) | 1 oz. | | 10 | ½ | ,, | ,, |
| Ginger (sliced) | 28 grs. | | | | | |
| INF. SERPENTARIÆ (No 20 pow.) | ¼ oz. | | 10 | ½ | ,, | ,, |
| INF. UVÆ URSI (bruised) | ½ oz. | | 10 | 1 | ,, | ,, |
| INF. VALERIANÆ (bruised) | ¼ oz. | | 10 | 1 | ,, | ,, |

*General Directions given in German Pharmacopœia.*—Infusions for which the amount of the respective substances is not specified, are prepared so that 10 parts of strained product are obtained from 1 part of substance. In the case of substances for which a limit of dose is given the quantity of substance is to be specified by the physician.

*Directions in United States Pharmacopœia.*—An ordinary Infusion, the strength of which is not directed by the physician nor specified by the Pharmacopœia, shall be prepared as follows:—Put 10 of the substance into a suitable vessel, provided with a cover, pour upon it 200 of boiling Water, and let it stand half-an-hour; then strain and pass enough Water through the strainer to make the Infusion measure 200 parts. The strength of Infusions of energetic or powerful substances should be specially prescribed by the physician.

# INJECTIONES HYPODERMICÆ.

## HYPODERMIC INJECTIONS.

The following are now contained in the British Pharmacopœia, the formulas for which will be found under the names of the substances from which they are prepared:—

| | | | | |
|---|---|---|---|---|
| INJECTIO APOMORPHINÆ HYPODERMICA. | 2 grs. | in | 100 minims. |
| INJECTIO ERGOTINI HYPODERMICA about | 1 | ,, | 3 ,, |
| INJECTIO MORPHINÆ HYPODERMICA . . | 1 | ,, | 10 ,, |

Most of the medicines used hypodermically can be obtained either in the form of **Gelatine lamels** or **compressed discs.**

**Not Official.**

# INULA.

## ELECAMPANE.

The root of the *Inula helenium.*

It contains large quantities of Inulin, a body allied to starch; also a crystalline bitter substance Helenin or Alantcamphor.

(Belg., Dutch, Fr., Ital., Port., Span., Swed. and U.S.; not in the others.)

**HELENINE** ($C_6H_{10}O$).—Colourless acicular crystals, almost insoluble in Water, but readily soluble in hot Alcohol, Ether, and Volatile Oils. Has been found to possess powerful antiseptic properties, and has been given in bronchial pneumonia, tuberculosis, and diphtheria.

**Dose.**—$\frac{1}{7}$ to $\frac{1}{2}$ grain.

# IODOFORMUM.

## IODOFORM.

$CHI_3$, eq. 394.

A product of the action of Iodine on a mixture of Alcohol and solution of Carbonate of Potassium.

Shining, lemon-yellow crystalline scales; somewhat greasy to the touch; having a persistent and disagreeable odour and flavour. Its solutions are neutral to Litmus paper.

It is also commercial in the form of **powder** (precipitated), which is more convenient for incorporation with other substances.

Iodoform is slowly volatile at the ordinary temperature of the air.

**Solubility.**—Very sparingly soluble in Water; 1 in 7 of Ether; 1 in 14 of Chloroform; 1 in 120 of Rectified Spirit. It is also soluble in the fixed and volatile oils, and about 1 in 100 of Glycerine; 1 in 30 of Olive Oil; 1 in $3\frac{1}{3}$ of Bisulphide of Carbon; sparingly in Benzin.

Precipitated Iodoform frequently gives a turbid solution in Chloroform and

Bisulphide of Carbon, owing to the dampness of the powder, the adhering water being insoluble.

It rapidly dries on free exposure to air, and will then form a clear solution.

**Tests.**—When heated it first melts to a brown liquid, then gives off brown and violet vapours, leaving a black residue which entirely disappears on continued ignition. Warmed with an alcoholic solution of Potash, Formate and Iodide of Potassium result, and from the resulting fluid when acidified with Nitric Acid, Iodine is liberated, the mixture acquiring a brown colour, or when cold a blue colour, on the addition of Mucilage of Starch.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., Swed., Swiss and U.S.; not in Norw.)

**Medicinal Properties.** Antiseptic, disinfectant, and local anæsthetic. Useful in chancres, or syphilitic sores, the **powder** being applied, or an **ointment** (1 drm. to 1 oz. of Lard), or dissolved in Oil of Eucalyptus. Used to relieve the pain of cancer and abate the progress of the disease; also to relieve sciatica and neuralgia.

A good **application** is made by dissolving 1 of Iodoform in 10 of Collodion.

**Whitehead's Varnish** is Compound Tincture of Benzoin, in which Ether (sp. g. ·735) has been substituted for Rectified Spirit, and containing 10 per cent. of Iodoform.

As a paint, or with an insufflator, in diphtheria (*L.* '86, i. 476), (*L.M.R.* '89, 20); on its antiseptic properties (*B.M.J.* '87, ii. 1439), (*T.G.* '87, 767); in phthisis (*B.M.J.* '88, i. 186); hypodermically in syphilis (*T.G.* '85, 643); to prevent pitting in smallpox (*L.* '86, ii. 889).

As an antiseptic, Iodoform in fine powder is used as a **spray.**

Eucalyptus Oil, Balsam of Peru, and Coumarin prepared from Tonka beans have been used to cover the smell of Iodoform.

Oil of Geranium answers the purpose best (5 mins. to 2 drms.)

**Dose.**—1 to 3 grains; the Iodoform should be finely powdered, or still better, use precipitated Iodoform, and suspend it with mucilage for a **mixture**; or it may be given in **pills**, made with Glucose and Treacle.

Iodoform is incompatible with Calomel.—*P.J.* xvii. 882; *T.G.* '88, 200.

## Preparations.

### SUPPOSITORIA IODOFORMI.

Iodoform, in powder, 36 grs.; Oil of Theobroma, 144 grs.: rub the Iodoform with 44 grs. of the Oil of Theobroma in a slightly warmed mortar, and add this to the remainder of the Oil of Theobroma previously melted at a low temperature: mix thoroughly, and pour into moulds of the capacity of 15 grs.

Each suppository contains 3 grs. of Iodoform.

### UNGUENTUM IODOFORMI.

Iodoform, 1; Benzoated Lard, 9: melt the Lard at a low temperature, add the Iodoform, and stir together until dissolved and finally cooled. =(1 in 10).

(U.S., 1 in 10; not in the other Pharmacopœias.)

Not Official.

**IODOFORM ANTISEPTIC DRESSINGS.**—**Gauze** 5, 10, and 20 per cent., **Wool** and **Lint** 3, 5, and 10 per cent.

**BOUGIES OF IODOFORM AND EUCALYPTUS FOR GONORRHŒA** (*Cheyne*).—Iodoform, 5 grs.; Oil of Eucalyptus, 10 minims; Oil of Theobroma, 35 grs. in each bougie, which should be 4 inches long and the diameter of No. 10 catheter.

*Treatment.*—The patient to pass water, then lie on his back, introduce the bougie (first dipped in Eucalyptus Oil or Carbolic Oil 1 in 20), close the orifice with a pad of Boracic Lint covered with Gutta-percha tissue, secure in position with strapping. The patient should refrain from passing water for four or five hours. If the case be severe the introduction of the bougie is repeated after passing water. The next day use an injection of Sulphocarbolate of Zinc, 2 grs. to 1 oz., for two or three days; and on the third or fourth day, when the symptoms have entirely subsided, use an injection of Sulphate of Zinc, 2 grs. to 1 oz. The treatment can be commenced as early as the first day or as late as the seventh day of the disease. The patient must abstain from alcohol.—*B.M.J.* '80, ii. 125; *L.* '82, ii. 176, 213.

**INSUFFLATIO IODOFORMI** (*T.H.*).—Iodoform in fine powder, 2; Starch in powder, 1: mix.

Antiseptic and mildly caustic.

**INSUFFLATIO IODOFORMI (AURAL)** (*T.H.*).—Iodoform in fine powder, 1; Subnitrate of Bismuth, 1: mix.

Antiseptic and mildly caustic.

**NEBULA IODOFORMI** (*T.H.*).—Iodoform, 40 grs.; Ether (sp. g. ·735), 1 oz.; dissolve.

A strong antiseptic and detergent.

**UNGUENTUM IODOFORMI CUM ATROPINA** (*L.O.H.*).—Precipitated Iodoform, 60 grs.; Atropine, 2 grs.; Soft Paraffin, 1 oz.: heat the Atropine and Paraffin till dissolved: stir, and while cooling add the Iodoform.

**EUROPHEN** (DI-ISOBUTYL-ORTHOCRESOL IODIDE).—Introduced as a substitute for Iodoform. Insoluble in Water or Glycerine; freely soluble in Alcohol, Chloroform or Ether. Applied as a dusting **Powder,** or 10 per cent. **Ointment.**

Not Official.

## IODOL.

TETRAIOD PYRROL.

$C_4I_4NH$.

Prepared by precipitating with Potassium Iodo-iodide a moderately pure Pyrrol obtained from "animal oil." It forms a light brown microcrystalline powder without taste, having a faint odour, and containing 90 per cent. of Iodine, and giving off Iodine at 212° F. (100° C.).—*P.J.* xvi. 368.

**Solubility.**—Nearly insoluble in Water; 1 in 18 of Rectified Spirit, 1 in 150 of Chloroform, 1 in 1½ of Ether, 1 in 155 of Glycerine. It is stated to be soluble 1 in 3 of Absolute Alcohol, but the sample we examined gave 1 in 6½.

(Ital., Russ. and Swiss; not in the others.)

**Medicinal Properties.**—Antiseptic; used for the same purposes as Iodoform, but it is free from the objectionable odour of the latter, and is stated not to be so poisonous.

In ophthalmic surgery.—*B.M.J.* '86, i. 1229; *L.M.R.* '86, 257; '87, 125.

In ear diseases.—*L.* '86, ii. 745; *T.G.* '88, 192.

In diphtheria.—*B.M.J.* '87, i. 789.

In naso-pharyngeal diseases.—*B.M.J.* '87, ii. 1439.

# IODUM.

IODINE.

I, eq. 127.

A non-metallic element, obtained from the ashes of sea-weeds, and from mineral Iodides and Iodates.

Sublimed in laminar crystals of a dark colour and metallic lustre, and of peculiar odour, and when heated yields a beautiful violet-coloured vapour.

It volatilises considerably at ordinary temperatures, and melts at 107° C.

It stains the skin a yellowish-brown, which can be removed by Alkali or Hyposulphite of Sodium.

In all the preparations containing Iodine, Iodide of Potassium is a constant ingredient, presumably with the intention of assisting the solution of the Iodine. In the case of aqueous solutions this is necessary, and an excess of Iodide is advantageous. In spirituous solutions, however, where the Iodide is scarcely more soluble than the Iodine, a much smaller quantity (if any) is required.

**Solubility.**—1 in 7000 of Water; 1 in 12 of Rectified Spirit; 1 in 4 of Ether; 1 in 30 of Chloroform; 1 in 6 of Bisulphide of Carbon; 1 in 65 of Glycerine; soluble in a solution of Iodide of Potassium.

**Tests.**—Entirely soluble in Ether. It sublimes without leaving any residue, and the portion which first comes over does not include any slender colourless prisms, emitting a pungent odour (Cyanide of Iodine). 12·7 grains dissolved in 1 ounce of Water containing 15 grains of Iodide of Potassium require for complete decoloration 1000 grain-measures of the volumetric solution of Hyposulphite of Sodium; *i.e.* to change the whole of the equivalent 12·7 grains of Iodine into colourless Iodide and Tetrathionate of Sodium. A trace of Iodine added to Mucilage of Starch gives a deep blue colour, disappearing on boiling, but returning on cooling, if the boiling has not been too prolonged.

Commercial resublimed Iodine, if in large dry scales, may be reckoned at 100 per cent.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Antiseptic, alterative, deodoriser, disinfectant; also irritant or vesicant according to the strength employed. It acts specially as a stimulant to the entire lymphatic system, causing absorption, promoting elimination by the kidneys. Used in chronic inflammation, to promote absorption and elimination in dropsies (pleuritic effusion, hydrocele, &c.), and chronic rheumatism. In the form of Iodide of Potassium it is specific in the later stages of syphilis. Most efficacious in glandular enlargements and morbid growths, as in bronchocele, externally and by hypodermic injection, in scrofulous glands of the neck and abdomen, and as an alterative in obstinate mucous discharges; caution, however, is required, as it may occasion wasting in healthy glands, such as the mammæ and testes. Externally the **liniment** or **tincture** is applied in chronic skin diseases, and to swollen and indurated parts and diseased joints, to cause absorption. A few drops of the tincture in half a pint of hot water may be **inhaled** in some forms of chronic bronchitis and phthisis. Best administered in the form of **tincture,** largely diluted with water. It is applied as a **gargle**, 1 or 2 of the tincture in 32 of water, for ulceration of the throat.

As injections in goître.—*B.M.J.* '85, i. 653, 715.

**Dose.**—Of free Iodine, ½ gr., gradually increasing.

Contained in Pilula Ferri Iodidi and Syrupus Ferri Iodidi.

The Iodides of Arsenic, Mercury, Potassium, Sodium, and Sulphur are official.

**Incompatibles.**—Alkalies, Metallic Salts, Vegetable Alkaloids.

**Antidotes.**—Emetics aided by Demulcent Drinks, Starch, Flour, etc., diffused in water; Hypodermic Injection of Morphine to relieve pain.

## Preparations.

### LINIMENTUM IODI.

Iodine, 5; Iodide of Potassium, 2; Glycerine, 1 (by weight); Rectified Spirit, 40: dissolve. =(about 1 of Iodine in 9).

Powdering the Iodide of Potassium greatly diminishes the time required for solution.

(Not in the other Pharmacopœias.)

Proper strength to paint upon bursæ and enlarged glands.

### LIQUOR IODI. *N.O.Syn.*—LUGOL'S SOLUTION.

Iodine, 22 grs.; Iodide of Potassium, 33 grs.; Distilled Water, sufficient to produce 1 fl. oz. =(1 of Iodine in 20).

If to the Iodine and Iodide of Potassium just enough Water be added to cover them, solution is more rapid than if the full quantity be added at once.

(Fr., Soluté d'Iode Ioduré, Iodine 1, Iodide of Potassium 1, Alcohol 10. Water 18; Norw. and Swed., Solutio Superiodeti Kalici, Iodine 1, Iodide of Potassium 2, Distilled Water 97; Port., Soluto Iodo-iodetado, Tincture of Iodine 6, Iodide of Potassium 1, Water 13; U.S., Liquor Iodi Co., Iodine 1, Iodide of Potassium 2, Distilled Water 17; all by weight; not in the others.)

### TINCTURA IODI.

Iodine, ½; Iodide of Potassium, ½; Rectified Spirit, 20; dissolve. =(1 of Iodine in 40).

As in the case of the Liniment, the Iodide of Potassium should first be powdered. It has also been suggested to dissolve the ingredients in 1 of Water (solution being very rapid) and then to add Spirit to make 20.

It has also been suggested to omit the Iodide of Potassium, which is not required as a solvent.

**Dose.**—5 to 20 minims. Also an **application** to the throat in diphtheria.

(The following without the Iodide of Potassium:—Austr., 1 and 15; Belg. and U.S., 1 in 14·3; Fr. and Ital., 1 and 12; Dan., Norw., and Swed., Sol. Iodi Spirituosa, 1 in 20; Dutch, 1 in 12½; Ger., Hung., and Russ., 1 and 10; Port. and Swiss., 1 and 9; Span., Solucion Alcoholica de Iodo, 1 and 15. All by weight except U.S.)

Hyposulphite of Sodium decolorises Solutions of Iodine.

## UNGUENTUM IODI.

Iodine, 32 grs.; Iodide of Potassium, 32 grs.; Glycerine, 1 drm.: rub together, add Prepared Lard, 2 oz., and mix.

=(1 of Iodine in 31).

Useful application for chilblains.

(Fr., Pommade d'Iodure de Potassium Ioduré, Iodine 1, Iodide of Potassium 5, Benzoated Lard 40, Water 5; Hung., Tincture of Iodine 1, Simple Ointment 9; Port., Pomada de Iodeto de Potassio Iodada, Iodine 1, Iodide of Potassium 4, Water 5, Lard 40; Span., Pomada de Ioduro Potasico Iodado, Iodine 2, Iodide of Potassium 6, Water 4, Lard 45; U.S., Iodine 4, Iodide of Potassium 1, Water 2, Benzoinated Lard 93; mix. Not in the others.)

## VAPOR IODI. Inhalation of Iodine.

Tincture of Iodine, 1 drm.; Water, 1 oz.; mix in a suitable apparatus, and having applied a gentle heat, let the vapour that rises be inhaled.

(Not in the other Pharmacopœias.)

### Not Official.

**CAUSTICUM IODI** (*B.S.H.*).—Iodine, 180 grs.; Iodide of Potassium, 60 grs.; Rectified Spirit, 1 oz.: dissolve.

Used in cases of lupus and of indolent (*i.e.* non-phagedænic) tertiary syphilitic ulcers.

**INHALATIO IODI C. CONIO.**—$\frac{1}{2}$ drm. to 1 drm. of Succus Conii being added to Vapor Iodi, B.P.

**IODO-GLYCERINE SOLUTION** (*Morton's*).—Iodine, 10 grs.; Iodide of Potassium, 30 grs.; Glycerine, 1 oz.: dissolve.

For spina bifida, inject 30 minims, without allowing the fluid contents of the tumour to escape.—*B.M.J.* '85, i. 1098; '86, i. 874; '87, ii. 1275.

**PIGMENTUM IODI** (*B.S.H.*).—Iodine, 2; Iodide of Potassium, 1; Glycerine, 4; dissolve.

Used to destroy vegetable parasites.

**PIGMENTUM PICIS C. IODO** (*B.S.H.*), (*Coster's Paste*).—Iodine, 120 grs.; Rectified Oil of Tar, 1 oz.: dissolve cautiously, applying a gentle heat as required.

Specially recommended in cases of ringworm.

**LIQUOR AMMONIÆ IODIDI** (*Sir J. Y. Simpson*).—Liq. Ammon. Fortiss., 2 oz.; Iodine, 10 grs.; Iodide of Potassium, 20 grs.; Rectified Spirit, 1 oz.: dissolve.

**TINCTURA IODI DECOLORATA** (*B.P.C.*).—Iodine, 250 grs.; Rectified Spirit, $5\frac{1}{2}$ oz.: dissolve with a gentle heat: when cold add Stronger Solution of Ammonia, 10 drs.; keep the mixture in a warm place until decolorised,* after which dilute with Rectified Spirit to make 20 oz.

The Iodine of this preparation seems to exist wholly as Iodide of Ammonium, (p. 80).

This preparation is now deleted from the Russian Pharmacopœia.

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* B.P.C. states that if not further diluted it may be prescribed as **Tinctura Iodi Decolorata Fortior.**

# IPECACUANHA.

## IPECACUANHA.

The dried root of *Cephaëlis ipecacuanha.*

The active principle resides in the bark, the inner or woody part possessing scarcely any of its virtues.

From the latest experiments by Paul and Cownley (*P.J.* xxiv. 61), it would appear (1) that the percentage of *total alkaloid* in Brazilian Ipecac. root does not vary much from 2 per cent.; (2) that the stems of the plant, with which the imported root has recently been found mixed, contain about one-half the total alkaloid of the root; (3) that the bulk of the root alkaloid is amorphous, but accompanied by a small proportion of a crystalline alkaloid, which is present in much larger quantity in the stem alkaloid; (4) that Carthagena (New Granada) Ipecacuanha also contains an amorphous and a crystalline alkaloid, but the latter is different from that yielded by the Brazilian root.

It is also stated by Paul (*P.J.* xxiv. 212) that from so-called deëmetinised Ipecacuanha he had obtained nearly ·5 per cent. of the ordinary alkaloid of Ipecacuanha.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Diaphoretic and expectorant. Emetic in large doses. Ipecacuanha has long been relied on in the East for the cure of dysentery in the acute stage. When the evacuations are frequent and accompanied with mucus, 20 to 30 grains are given; and if the stomach rejects it, a little Opium is given with it, or a Mustard poultice applied to the stomach. It relieves some forms of vomiting. It is commonly added to aperient pills. A **spray** of the Wine of Ipecacuanha has been strongly recommended by Drs. Ringer and Murrell for chronic bronchitis and asthma.

Ipecacuanha in the treatment of anthrax and carbuncle.—*L.* '88, i. 269.

*Is a powerful hepatic stimulant, it increases slightly the secretion of intestinal mucus, but has no other apparent stimulant effect on the intestines.—Dr. Rutherford.*

Applied to the bites and stings of insects.

**Dose.**—In powder as an emetic, 15 to 30 grs.; as an expectorant, etc., ½ to 2 grs.

Prescribed in ¼ to 1 gr. doses as an auxiliary in alterative pills.

Contained in Pil. Conii Comp.

**Incompatibles.**—Salts of Lead, Mercury, Vegetable Acids, Astringent Infusions.

### Preparations.

### ACETUM IPECACUANHÆ.

Ipecacuanha, in No. 20 powder, 1; Diluted Acetic Acid, sufficient to produce 20; moisten the powder with a suitable quantity of the menstruum and macerate for twenty-four hours; pack in a percolator and gradually add the Acid until the required volume of the Vinegar of Ipecacuanha is obtained.

Throws down slightly during the first few weeks, but if then filtered will remain bright.

**Dose.**—5 to 40 minims as an expectorant.

(Not in the other Pharmacopœias.)

## PILULA IPECACUANHÆ CUM SCILLA.

Compound powder of Ipecacuanha, 3; Squill, in powder, 1; Ammoniacum, in powder, 1; Treacle, *q. s.*
=(3 Dover's Powder in 7, or about 1 of Opium in 23).

**Dose.**—5 to 10 grs.

(Port., similar to Brit.; not in the other Pharmacopœias.)

## PULVIS IPECACUANHÆ COMPOSITUS. *N.O.Syn.*—PULVIS IPECACUANHÆ CUM OPIO; PULVIS DOVERI.

Ipecacuanha, in powder, 1; Opium, in powder, 1; Sulphate of Potassium, 8: mix. =(1 Opium, 1 Ipecac. in 10).

(In all the Pharmacopœias, and is the well-known Dover's Powder; Austr., Ger., Russ. and Swiss, Pulvis Ipecacuanhæ Opiatus; Hung., Pulvis Doveri; Dan., Norw. and Swed., Pulv. Ipecac. Thebaicus; Dutch, Pulvis Opii Compositus; Fr., Poudre d'Ipecacuanha Opiacée; Port., Po de Ipecacuanha Composto; U.S., Pulvis Ipecacuanhæ et Opii, with Sugar of Milk; all same strength as Brit.; Span., Polvo de Ipecacuana Opiado, 1 Opium, 1 Ipecacuanha, in 11·4; Belg., 9 *Extract* Opium, 9 Ipecac., in 100; Ital., Polvere di Oppio e di Ipecacuanha, Opium 1, Ipecacuanha 1, Liquorice powder 1, Nitre 2, Sulphate of Potash 2.)

The original Powder of Dr. Dover was prepared by fusing together 4 parts of Nitrate of Potash with 4 of Sulphate of Potash, and reducing the product to fine powder; to this was added 1 of Ipecacuanha, 1 of Opium, and 1 of Liquorice; the French Codex has now made it same strength as British; the Belgian still retains the powdered Extract of Opium instead of Opium itself, which nearly doubles the strength.

**Medicinal Properties.**—An admirable anodyne diaphoretic; it is also most useful in dysentery and diarrhœa; in the latter case it is sometimes combined with Calomel. In doses of 3 or 4 grs. it will relieve heartburn, probably by allaying irritability.

**B.P. Dose.**—5 to 15 grs.

## TROCHISCI IPECACUANHÆ.

Made with Ipecacuanha in powder, Sugar, Gum Acacia, and Mucilage of Gum Acacia.

Each lozenge contains ¼ gr. of Ipecacuanha.

**Dose.**—1 to 3 lozenges.

(Belg. and Ital., about ¼ grain; Austr., Dutch, Fr., Port., Russ., and Swiss, about ⅙ grain; Span., about ½ grain; U.S., about ⅓ grain; not in the others.)

## TROCHISCI IPECACUANHÆ ET MORPHINÆ. *See* TROCHISCI MORPHINÆ ET IPECACUANHÆ.

## VINUM IPECACUANHÆ.

Ipecacuanha, in coarse powder, 1; Acetic Acid, 1; Distilled Water, *q. s.*; Sherry, 20: macerate the Ipecacuanha in the Acetic Acid twenty-four hours; pack in a percolator, and pass sufficient Distilled Water through to produce 20; evaporate the liquor to dryness over a water bath. Powder the residue and macerate it in the Sherry forty-eight hours, with occasional agitation, and filter. =(1 in 20).

The root is practically exhausted with half the quantity of Water given above.

In one experiment 16 oz. of root yielded 3 oz. and 24 grs. of dry extract, of which only 122 grs. did not dissolve in the Wine.

The general opinion appears to be against evaporating the percolate further than to a soft extract, as the alkaloid appears to be damaged by continued heating.

It is proposed to make the Vinum from a standardised Acetic Extract, or from a standardised Alcoholic Fluid Extract.

**Dose.**—As an expectorant, etc., 5 to 40 minims; as an emetic, 3 to 6 drms.

(Belg., 6 in 100 of Malaga; Dutch, 1 and 10 of Malaga; Ger., Norw., Russ. and Swed., 1 and 10 of Sherry; Port., 1 in 20 of Port; U.S., with fluid Extract, 1 in 10 of Alcohol and White Wine; not in the others.)

### Not Official.

**SYRUPUS IPECACUANHÆ.**—

Austr., Ger., and Hung.—Bruised Ipecacuanha, 1; Rectified Spirit, 5; Water, 40: digest forty-eight hours, and filter 40; add 60 of Sugar, and dissolve to make 100 of Syrup.

Belg.—Tincture of Ipecacuanha, 35; Simple Syrup, 1000.

Dutch.—Tincture of Ipecacuanha, 1; Syrup, 19.

Fr.—Alcoholic Extract of Ipecacuanha, 1; Alcohol (60°), 3; Water, 34; Sugar, 63.

Ital.—Ipecacuanha, 1; Dilute Alcohol, 5; Simple Syrup, 95.

Port.—Alcoholic Extract of Ipecacuanha, 1; Water, 35; Sugar, 65.

Russ.—Ipecacuanha, 1; Rectified Spirit, 5; Water, 40; Sugar, 60.

Span.—Alcoholic Extract of Ipecacuanha, 8; Water, 100; Syrup, 1150.

Swiss.—Fluid Extract of Ipecacuanha, 1; Syrup, 99.

U.S.—Fluid Extract of Ipecacuanha, 7; Acetic Acid, 1; Glycerine, 10; Sugar, 70; Water to 100.

All by weight except U.S.

**SYRUPUS IPECACUANHÆ ACETICUS** (*B.P.C.*).—Vinegar of Ipecacuanha (*B.P.C.*), 20 oz.; Refined Sugar, 36 oz.: dissolve with a gentle heat. Sp. g. 1·33.

**Dose.**—15 to 120 minims.

**TINCTURA IPECACUANHÆ.**—Bruised Ipecacuanha, 1; Proof Spirit, 10; digest eight days, press, and make up to 10.

According to a series of experiments, detailed *C.D.* '91, ii. 706, the best menstruum for making the tincture is Rectified Spirit containing 60 minims of Liquor Ammoniæ per 20 ounces. Proof extracts the alkaloid almost as well as the Rectified Spirit, but the result does not remain bright.

(Austr., Dutch, Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Port. and Span., 1 in 5; all by weight; not in the others.)

## JABORANDI.

JABORANDI.

The dried leaflets of *Pilocarpus pennatifolius.*

There are two varieties of Jaborandi, (1) from Pernambuco, characterised by the prominent veining on the upper side of the leaf, and attributed (Holmes thinks erroneously) to *P. pennatifolius*; and (2) from Rio Janeiro, the product of *P. Selloanus,* without the prominent veining and containing much less alkaloid.—*P.J.* xxi. 837.

Holmes subsequently found that Pernambuco leaves are derived from another species, for which he proposes the name Pilocarpus Jaborandi (*P.J.* xxii. 875), and this name has been adopted in the U.S.P.

It contains an alkaloid **Pilocarpine,** the Nitrate of which is Official, and possibly other alkaloids, one of which (Jaborine) is antagonistic to Pilocarpine in its physiological action.

(Belg., Fr., Ger., Ital., Port., Russ., Span. and Swiss; U.S. (Pilocarpus); not in the others.)

**Medicinal Properties.**—Diaphoretic, sialagogue, and galactagogue. Useful in Bright's disease. It is antagonistic in its action to Belladonna.

**B.P.Dose.**—5 to 60 grs.

*Is a very feeble hepatic stimulant.—Dr. Rutherford.*

### Preparations.

### EXTRACTUM JABORANDI.

Macerate 16 of Jaborandi, in No. 40 powder, with 40 of Proof Spirit for forty-eight hours; then transfer to a percolator, and when the fluid ceases to pass continue the percolation with Water until 40 of liquid has been collected; evaporate the percolated liquid to a suitable consistence.

**Dose.**—2 to 10 grs.

(Belg. and Fr.; not in the others. U.S. has **Fluid Extract** 1 in 1.)

### INFUSUM JABORANDI.

Jaborandi, cut small, 1; Boiling Distilled Water, 20: infuse half an hour and strain. =(1 in 20).

**Dose.**—1 to 2 oz.

(Span., 1 in 60; not in the other Pharmacopœias.)

### TINCTURA JABORANDI.

Jaborandi, in No. 40 powder, 5; Proof Spirit, 20: macerate for forty-eight hours in 15 of the Spirit, agitating occasionally; pack in a percolator; when it ceases to drop pour on the remaining Spirit; press the marc, filter, and add Proof Spirit to make 20. =(1 in 4).

**Dose.**—30 to 60 minims.

(Belg., Fr., and Span., 1 and 5; not in the others.)

Wright and Farr (*P.J.* xxii. 1) show an enormous variation in the strength of various samples of this tincture, viz., from ·032 to ·148 per cent. of alkaloid, and recommend a standard of ·1 per cent.

This agrees with the manufacturing yield of Pilocarpine Nitrate, viz., ·5 to ·6 per cent. of the leaf employed.—*C.D.* '92, ii. 147.

The best strength of Spirit to use is 50 per cent. (by volume).

**PILOCARPINÆ NITRAS.** *See* p. 404.

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## JALAPA.

### JALAP.

The dried tubercules of *Ipomœa purga* (Hayne), otherwise called *Exogonium purga* (Bentham).

As stated in our previous edition, this Jalap contains, as its principal ingredient, a glucoside **Convolvulin,** insoluble in Ether, and constituting all but a small part of Resina Jalapæ B.P.

Tampico Jalap from *Ipomœa simulans*, and Orizaba root (Woody Jalap), from *Convolvulus* or *Ipomœa Orizabensis*, also yield a glucoside **Jalapin**, soluble in Ether, and almost, if not completely, identical with Resina Scammonii B.P. from *Convolvulus Scammonia.*

It is unfortunate that the name Jalapin should have been applied to the resin of *spurious* Jalap, which is identical with the *true* Resin of Scammony, and which is quite distinct from the Official Resin of Jalap.

During 1892, attention was again called to this misleading nomenclature (*P.J.* xxii. 888), and considerable correspondence ensued. It appears that it has been customary in this country to apply the term "Jalapin" to the true Jalap Resin, but the article imported from Germany under that name is invariably the Ether-soluble Resin from spurious Jalap or Scammony. Several suggestions were made, but none which seemed at all likely to be acceptable both in Britain and Germany. The most feasible proposal is that the term "Scammonin" should be used to designate the Ether-soluble Resin (lately shown, *P.J.* xxiii. 86, to be identical from either of the previous named sources), and that the earliest opportunity should be taken to make Official, under the name Jalapin, an Ether-wholly-insoluble Resin from true Jalap.

**Test.**—Treated as for the preparation of Resin of Jalap, not less than 10 per cent. of Resin should be obtained, of which not more than $\frac{1}{10}$ should be soluble in Ether.

There is a general concensus of opinion that the quality of commercial Jalap has of late years become so degraded that the present Official standard (10 per cent.) will have to be lowered, probably to 8 per cent., with a corresponding increase in the proportion of Jalap used in the Tincture.

The Codex (1884) fixed the standard at 16—18 per cent., U.S. (1880 and 1890) at 12 per cent., but Ger. (1890) has lowered the figure to 7 per cent.

For a resin-estimation process extracting with Amylic Alcohol and freeing from Water soluble compounds by washing in separator, *see P.J.* xxiii. 107.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—A brisk cathartic, operating sometimes painfully, producing copious watery discharges. From its hydragogic powers, it is especially applicable to dropsy, when it is usually combined with Bitartrate of Potassium or Calomel.

*Is a moderately powerful hepatic, and a powerful intestinal stimulant.—Dr. Rutherford.*

**Dose.**—10 to 30 grs.

Contained in Pulvis Scammonii Compositus.

## Preparations.

### EXTRACTUM JALAPÆ.

Jalap, in coarse powder, 1; Rectified Spirit, 5; Distilled Water, 10; macerate the Jalap in the Spirit for seven days, press out the tincture, then filter and distil off the Spirit, leaving a soft extract: again macerate the residual Jalap in the Water for four hours, express, strain through flannel, and evaporate by a water-bath to a soft extract; mix the two extracts, and evaporate at a temperature not exceeding 140° F. to a proper consistence for forming pills.

We have found 100 lbs. of Jalap to yield 50 lbs. of Extract. Squibb (*Y.B.P.* '72, 324) states that the total yield varies from 35 to 52 per cent., the alcoholic portion, 9 to 17 per cent., and the aqueous 26 to 40 per cent. Cripps (*P.J.* xxiii. 779) examined a number of commercial samples for Resin and found them to vary from 12 to 50 per cent.; a sample prepared by himself gave 23 per cent. of total Resin.

**Dose.**—5 to 15 grs.

(Russ. and U.S.; not in the other Pharmacopœias.)

### PULVIS JALAPÆ COMPOSITUS.

Jalap, in powder, 5; Acid Tartrate of Potassium, 9; Ginger in powder, 1: mix. =(1 in 3).

**Dose.**—20 to 60 grs.

(Russ., Jalap 1, Bitartrate of Potassium 2; Span., Jalap 1, Cream of Tartar 1, Magnesia 1; U.S. Jalap 35, Bitartrate of Potassium 65; not in the others.)

### RESINA JALAPÆ.

A resin obtained from Jalap by means of Rectified Spirit.

Digest 8 of Jalap (in No. 40 powder) with 16 of Rectified Spirit in a covered vessel, heating gently, for twenty-four hours; then transfer to a percolator, and when the Tincture ceases to pass continue the percolation with successive portions of Spirit until it ceases to dissolve anything more. Add to the Tincture 4 of Distilled Water, and distil off the Spirit by a water-bath. Remove the residue while hot to an open dish and allow it to become cold. Pour off the supernatant liquid from the Resin, wash this two or three times with hot Water, and dry it on a porcelain plate by the heat of a stove or water-bath.

**Test.**—The powder yields little or nothing to warm Water, and not more than 10 per cent. to Ether.

Easily soluble in Rectified Spirit; insoluble in Oil of Turpentine.

**Dose.**—2 to 5 grs.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

### TINCTURA JALAPÆ.

Jalap, in No. 40 powder, 1; Proof Spirit, 8: macerate forty-eight hours in 6 of the Spirit, agitating occasionally, pack in a percolator, and when the fluid ceases to pass, pour on the remaining Spirit, press, filter, and add Proof Spirit to make 8. =(1 in 8).

**Dose.**—½ to 2 drms.

(Belg., Fr. and Port., 1 and 5 by weight; not in the others. Belg., Fr., Port. and Swiss have a Compound Tincture.)

### Not Official.

**SAPO JALAPINUS.**—

Ger. and Russ.—Resin of Jalap, 4; Soap, 4; Sp. Wine, 8; evaporate to 9 by weight.

Swiss.—Resin of Jalap, 9; Hard Soap, 9; Glycerine, 1; Alcohol, 12; evaporate to 20 by weight.

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### Not Official.

## JAMBUL.

The Seeds of *Eugenia Jambolana*, which have been used in India and this country for diabetes.—*P.J.* xviii. 921; *B.M.J.* '91, ii. 1283.

Not Official.

## JUGLANS, U.S.

The bark of the root of *Juglans cinerea* (Butternut), collected in autumn.

A mild cathartic, used in the form of **Extractum Juglandis U.S.**, which is prepared with Dilute Alcohol, and **Juglandin**, an eclectic remedy, which was found by Rutherford to be a moderately powerful hepatic stimulant.

Not Official.

## SPIRITUS NUCIS JUGLANDIS.

A distilled preparation from the Walnut (*Juglans Regia*).

**Dose.**—1 to 4 drachms.

## JUNIPERI OLEUM.

### OIL OF JUNIPER.

The Oil distilled in Britain from the full-grown unripe green fruit of *Juniperus communis*.

Sp. g. ·860 to ·880. Of very superior flavour to the imported Oil.

Messrs. Schimmel state that doubly Rectified Oil of Juniper has sp. g. ·858.

**Solubility.**—1 in 20 of Rectified Spirit, but it does not become quite clear: it mixes with equal parts of Absolute Alcohol, but if more Alcohol be added it becomes milky.

(Austr., sp. g. ·870; Belg., sp. g. ·853—·911; Dan., sp. g. ·850—·870; Fr. (Genièvre), Ger., Norw. and Swed., sp. g. not given; Hung., sp. g. ·840—·900; Ital. (Essenza di Ginepro), ·850; Port. (Essencia de Zimbro), sp. g. ·855—·879; Russ., sp. g. ·850—·900; Span. (Esencia de Enebro); Swiss, sp. g. ·85—·86; U.S., sp. g. ·850—·890; not in Dutch.)

**Medicinal Properties.**—Stimulant, carminative, and diuretic, the latter property constituting its chief medicinal value. Used in debilitated dropsical cases, either alone or combined with other diuretics.

**Dose.**—1 to 4 minims.

### Preparation.

**SPIRITUS JUNIPERI.**

Oil of Juniper, 1; Rectified Spirit, 49: dissolve. =(1 in 50).

**Dose.**—30 to 60 minims.

(Fr., 1 in 50; Russ., 1 in 100; both by weight; U.S., 1 in 20; Austr., Ger. and Swiss, 1 fruit in 4, by distillation; Span., 3 fruit in 19 by distillation; Dutch, Port. and U.S., have a compound spirit; not in the others.)

## KAMALA.

### KAMALA.

*N.O.Syn.*—GLANDULÆ ROTTLERÆ. WURRUS.

A fine, granular, mobile, brick-red powder, consisting of the minute glands and hairs obtained from the surface of the fruits of *Mallotus Phillippinensis*.

**Solubility.**—Scarcely mixing with water, but about 60 per cent. of a sample (containing 6 per cent. of ash) was soluble in, and formed a red-coloured solution with Alcohol, Chloroform, or Ether; for the most part soluble in Liquor Potassæ; sparingly in Benzin.

**Test.**—On ignition in air it should yield 4 or 5, or at most 10 per cent. of ash.

The pure drug does not yield more than 2 per cent. of ash, but most commercial samples give from 20 to 50 per cent.—*P.J.* xv. 654 ; xviii. 678 ; xxii. 394, 894.

(Austr.; Dutch; Ger., Hung., Russ. and Swiss (6 p. c. of ash); Hung. has also Kamala Depuratum ; Ital. ; Port. ; Swed. ; U.S. (8 p. c. of ash) ; not in the others.)

**Medicinal Properties.**—Purgative. Successfully given in tænia.

**Dose.**—30 to 120 grs. of the powder suspended in Gruel, Mucilage, Treacle, or Syrup, will of itself expel the worm. A purgative should, however, follow.

### Not Official.

**TINCTURA KAMALÆ.**—Kamala, 1 ; Proof Spirit, 5 : macerate seven days, and strain.

**Dose.**—1 to 2 drms.

### Not Official.

## KAOLIN.

*Syn.*—China Clay ; Porcelain Clay.

A fine white clay, derived from the decomposition of the felspar of granitic rocks ; extensive tracts of it occur in Cornwall. When finely ground and washed it is used as a form of Fuller's Earth for infants.

Has been used in Germany for many years as an **excipient for pills** of the easily reduced salts of metals, such as Chloride of Gold, Nitrate of Silver, and Permanganate of Potassium ; but a mixture of Paraffins answers better. *See* Massa Paraffinum, p. 391. It is also employed for clarifying Wine, Beer, and Syrups.

(Austr., Ger. and Hung., Bolus Alba ; Belg., Argilla ; Dan., Kaolinum ; not in the others ; Swiss has Alumina.)

### Preparations.

**UNGUENTUM KAOLIN.**

Soft Paraffin, 1 ; Hard Paraffin, 1 : melt, and add Kaolin, 1 ; stir till cold.

This has been proposed as a basis for pills containing Nitrate of Silver or Permanganate of Potassium.—*P.J.* '84, xv. 60.

A very great improvement upon it is the following :—

**MASSA KAOLIN.**—Soft Paraffin, 2 ; Hard Paraffin (m.p. 120° F.), 1 ; Kaolin, 1. This will make a good mass with three times its weight of Permanganate of Potassium.

A mixture of Hard Paraffin (m.p. 120° F.), 1 ; with Soft Paraffin, $1\frac{1}{2}$ ; answers even better, and will make a good mass with four times its weight of Permanganate, *see* Massa Paraffinum, p. 391

### Not Official.

## KAVA-KAVA.

The root of *Piper methysticum.*

Used by the inhabitants of the Polynesian Isles in the preparation of an intoxicating liquor.

An extract is used as a hypnotic, dose $\frac{1}{3}$ gr. to 1 gr.—*L.* '87, i. 105.

Lewin has separated an oily green substance (a resin), soluble in Alcohol and Petroleum Spirit, having the characteristic smell of Kava. It produced a marked and prolonged insensibility of the mucous membrane of the mouth, also of the conjunctiva and cornea.—*L.* '86, i. 658 ; *P.J.* xvi. 918.

### Not Official.

## KERATINE.

A substance introduced by Dr. Unna for coating pills which are intended to pass the stomach and dissolve in the small intestine. It is made by digesting horn shavings, first in artificial gastric juice (acidified Pepsine solution) until all the albuminous substances have been dissolved, and the residue in Ammonia Solution. The Ammoniacal Solution, evaporated, yields a gum-like liquid, which can be used for coating pills. The coating although unaffected by Hydrochloric Acid is soluble to some extent in Acetic and Citric Acids, which should therefore not be given at the same time.—*P.J.* xv. 422.

(Ger.; not in the other Pharmacopœias.)

### Preparation.

**LIQUOR KERATINI.**—Prepared Keratine, 1; Rectified Spirit, 5; Strong Solution of Ammonia, 5; mix the Spirit and Ammonia and dissolve the Keratine.

This makes a good coating, and dries quickly. It is better to give the pills a thin coating of Oil of Theobroma and then two coatings of Keratine.

## KINO.

KINO.

The juice obtained by incisions made in the trunk of *Pterocarpus marsupium*, inspissated without artificial heat.

In small, angular, brittle, glistening, reddish-black fragments, translucent, and ruby-red on the edges, inodorous, astringent.

Of 100 grains Tellicherry Kino, only 88 grains are dissolved by cold Water, and 35 grains of Isinglass will precipitate the whole of the astringent matter from the solution. Compared with Pale Catechu it is more soluble in Water, and the solution is more astringent.

**Tests.**—Almost entirely soluble in Rectified Spirit. It yields little or nothing to Ether.

(Belg., Fr., Port., Russ., Span. (Quino), Swed., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—A powerful astringent. Employed in obstinate diarrhœa and pyrosis. Also used for intermittents, with Cinchona. Best given in diluted Alcohol. Externally, as a styptic, and in powder to indolent ulcers.

**Dose.**—10 to 30 grs.

Contained in Pulvis Catechu Compositus.

**Incompatibles.**—Mineral Acids, Alkalies and Carbonates, Metallic Salts and Gelatine.

### Preparations.

**PULVIS KINO COMPOSITUS.**

Kino, in powder, 15; Opium, in powder, 1; Cinnamon, in powder, 4. =(1 Opium in 20).

Keep it in a well-closed vessel.

**Dose.**—5 to 20 grains.

(Not in the other Pharmacopœias.)

## TINCTURA KINO.

Kino, in coarse powder, 2; Glycerine, 3; Distilled Water, 5; Rectified Spirit, 12: macerate seven days, with occasional agitation, filter, and add Rectified Spirit to make 20. =(1 in 10).

NOTE.—Glycerine and Water have been introduced in the place of some of the Spirit, after the manner of the U.S.P. 1882, to prevent gelatinisation.

**Dose.**—$\frac{1}{2}$ to 2 drms.

(Fr., Russ., and Swiss, 1 in 5, by weight; U.S., 1 in 10; not in the others.)

Not Official.

**TROCHISCI KINO** (*T.H.*).—Containing 2 grains in each lozenge, with Black Currant paste.

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Not Official.

## KOLA.

The seeds of *Sterculia Acuminata*, a tree growing wild upon the Western Coast of Africa, between Sierra Leone and the Congo. The seeds contain 2 to 2·5 per cent. of Caffeine. Various preparations have been made from them, *i.e.*, **Kola-chocolate** and **Kola Wine**, also **Fluid Extract.**

It is used for the same purposes as Coca Leaves and Guarana, to prevent fatigue.

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## KOUSSO. *See* CUSSO.

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## KRAMERIÆ RADIX.

### RHATANY ROOT.

The dried root of Peruvian Rhatany, *Krameria triandra*, or of Savanilla Rhatany, *Krameria Ixina*.

The bark of both kinds has a strongly astringent taste, and when chewed tinges the saliva red, but it has no marked odour. The wood is nearly tasteless and inodorous.

It was pointed out by Holmes (*P.J.* xvi. 878), that the Savanilla Rhatany in the London market was really the Para Rhatany of "Pharmacographia," and that the Pharmacopœia description was somewhat mixed. It was corrected in subsequent reprints by changing "dark purplish or violet colour" to "dull purplish-brown." This made the Official description so far consistent, but left out of account the fact that the second commercial variety was the Para, and not the orthodox Savanilla at all.

(Austr., Belg., Dan., Dutch, Fr., Ger., Norw., Russ., Swed. and Swiss, Ratanhia; Hung., Ratanha; Ital., Port. and Span., Ratania; U.S., Krameria.)

**Medicinal Properties.**—A powerful astringent; tonic. Used in chronic diarrhœa, passive hæmorrhages and mucous discharges, as menorrhagia, leucorrhœa; and generally where Kino and Catechu are beneficial. The infusion is used as a **gargle** in relaxed sore throat. Locally in prolapsus ani or fistula ani.

**Dose.**—In powder, 20 to 60 grs.

Contained in Pulvis Catechu Compositus.

**Incompatibles.**—Alkalies, Lime Water, Salts of Iron and Lead, Gelatine.

### Preparations.

### EXTRACTUM KRAMERIÆ.

Macerate Rhatany Root, in No. 40 powder, 16, with cold Distilled Water, 30, twenty-four hours, then pack in a percolator and add more Distilled Water until 240 have been collected or the Rhatany is exhausted. Evaporate the liquor by a water-bath to dryness.

**Dose.**—5 to 20 grs.

(Austr., Belg., Dan., Dutch, Fr., Port., Russ., Span., Swed., and U.S.; Hung., crude extract purified with warm Water; Swiss, made with boiling Water; U.S. has also a **Fluid Extract.** Not in Ger. or Norw.)

### INFUSUM KRAMERIÆ.

Rhatany Root, in No. 40 powder, 1; boiling Distilled Water, 20: infuse half an hour, and strain. =(1 in 20).

**Dose.**—1 to 2 oz.

(Fr., Tisane, 1 in 50; not in the other Pharmacopœias.)

### TINCTURA KRAMERIÆ.

Rhatany Root, in No. 40 powder, 1; Proof Spirit, 8: macerate forty-eight hours in 6 of the Spirit, agitating occasionally; pack in a percolator; when it ceases to drop, pour on the remaining Spirit, press the marc, filter, mix the liquids and add Proof Spirit to make 8.

=(1 in 8).

**Dose.**—½ to 2 drms.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Norw., Port., Russ., Swed., Swiss and U.S., 1 in 5; all by weight except U.S. Not in Ital. or Span.)

Excellent for the teeth and gums when either spongy or inflamed.

### Not Official.

**EXTRACTUM KRAMERIÆ FLUIDUM, U.S.**—Rhatany Root, 1; exhausted with Diluted Alcohol and Glycerine, to produce 1 of fluid extract.

**GOSSYPIUM KRAMERIÆ** (*T.H.*)—Tincture of Rhatany, ½ oz.; Glycerine, 10 mins.; mix and saturate evenly with it Cotton Wool, 60 grs.

**SUPPOSITORIUM KRAMERIÆ.**—Extract of Rhatany, 8 grs.; Hydrochlorate of Morphine, $\frac{1}{10}$th gr.; Stearine, 10 grs.

(Fr. and Span., 1 gramme in each.)

**SYRUPUS KRAMERIÆ** (*U.S.*).—Fluid Extract of Krameria, 45; Syrup, 55.

Swiss.—Extract of Rhatany, 2; Water, 5; Syrup, 98: concentrate to 100 by weight.

**TROCHISCI KRAMERIÆ** (*T.H.*).—Containing 3 grs. of the Extract in each lozenge, with Red Currant paste.

(U.S., 1 grain in each.)

## LAC.

Fresh milk from the Cow, *Bos taurus*.

Used only for preparing Mistura Scammonii.

The specific gravity of good milk may be expected to lie between 1·027 and 1·036. The monthly averages given by Vieth (*Analyst* xiv., 69; xv., 44), and by Richmond (*Analyst* xviii., 51) are between 1·0315 and 1·0325. Addition of Water lowers the sp. g.; abstraction of cream raises it. The usual standard in proving adulteration is that the Milk should yield not less than 8·5 per cent. of "solids not fat," and ·7 per cent. of ash.—*See Analyst* xviii., 271.

### Not Official.

**ARTIFICIAL HUMAN MILK.**—Allow ⅓ of a pint of new milk (cow's) to stand for about twelve hours, remove the cream and add to it ⅔ of a pint of new milk, as fresh from the cow as possible. Into the ⅓ of a pint of blue milk left after abstraction of the cream, put a piece of rennet 1 inch square, set the vessel in warm water until the milk is fully curdled, which requires from five to fifteen minutes, the rennet being removed as soon as curdling commences, and put into an egg-cup for future use, as it can be employed daily for a month or two; break up the curd thoroughly, and separate the whole of the whey, which should be rapidly heated to boiling, when a little more casein separates, and may be removed by straining; 110 grs. of powdered milk-sugar is to be dissolved in this hot whey, and the sweetened fluid added to the ⅔ of a pint of new milk, to which the cream from the other ⅓ of a pint was added as already described.—*L.* '78, i. 390; and Frankland's "Experimental Researches."

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# LACTUCA.

## LETTUCE.

The flowering herb of the wild indigenous plant, *Lactuca virosa.*

Has been found to contain a minute quantity of a mydriatic alkaloid recognised as Hyoscyamine, but in commercial Lactucarium not a trace could be detected. (*P.J.* xxii. 449.)

(Belg., Dutch, Fr. (Laitue vireuse), Ital. (Lattuga virosa), Port. (Alface virosa), Span. (Lachuga) (L. Sativa); not in the others.)

**Medicinal Properties.**—Sedative; said also to be gently laxative, diuretic, and somewhat diaphoretic. Employed in dropsy combined with Squill, Digitalis, or other diuretics.

### Preparation.

### EXTRACTUM LACTUCÆ.

The inspissated juice evaporated to a pill consistence, according to the directions given for Extractum Belladonnæ.

100 lbs. of the plant yield 50 to 70 lbs. juice = 60 to 80 oz. of Extract.

**Dose.**—5 to 15 grs.

(Belg., with weak Spirit; Dutch, aqueous extract and alcoholic extract; Fr. and Ital., purified expressed juice evaporated; Port., alcoholic; Span., expressed juice evaporated; not in the others.)

The extract from the root is stronger than that made from the leaves.

### Not Official.

**EAU DISTILLEE DE LAITUE** (Fr.).—From Lettuce flowers, 1 in 1.

**SUCCUS LACTUCÆ.**—The expressed juice, 3; Rectified Spirit, 1: mix.

**Dose.**—1 to 2 drms.

Not Official.

## LACTUCARIUM.

The juice from the incised flower-stalk of *Lactuca virosa*, collected and dried.

(Austr., Belg., Dan., Dutch, Fr., Hung., Port., Swed. and U.S.; Belg., Fr. and Swed. use other species also; not in Ger., Ital., Norw., Russ., Span. or Swiss.)

**Dose.**—2 to 6 grs.

The preparations of Lettuce are highly prized by some practitioners for their sedative qualities, whilst others aver that they are almost inert.

### Preparations.

**SYRUPUS LACTUCARII.**—Macerate Lactucarium 1, with Benzin 4, for twenty-four hours, decant the Benzin solution, dry the residue, mix it with an equal bulk of clean dry sand, and exhaust with Proof Spirit to 8; evaporate this Tincture to 6, add Water enough to regain the measure of 8, then dissolve in it Sugar 14, and add Water to make 20.

**Dose.**—30 to 120 minims.

(U.S., 1 of Tincture in 10; not in the other Pharmacopœias.)

**TINCTURA LACTUCARII.**—Lactucarium, 1; Proof Spirit, 10: digest seven days, and filter.

**Dose.**—20 to 60 minims.

U.S., Lactucarium, 1 part, treated with Benzin, and then exhausted with a mixture of Alcohol, Glycerine, and Water to produce 2 parts.

## LANOLIN. *See* ADEPS LANÆ.

## LARICIS CORTEX.

LARCH BARK.

The bark of *Pinus larix;* collected in spring, deprived of its outer portion and dried.

The bark contains a volatile crystallisable acid, **Larixinic Acid,** which sublimes in vapour of water.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—Astringent, gently stimulant, useful in bronchitis with copious expectoration.

### Preparation.

**TINCTURA LARICIS.**

Larch Bark, in No. 40 powder, 1; Rectified Spirit, 8: macerate forty-eight hours in 6 of the Spirit, agitating occasionally; pack in a percolator, and when it ceases to drop, pour on the remaining Spirit; press the marc, filter, mix the liquids, and add Rectified Spirit to make 8. =(1 in 8).

**Dose.**—20 to 30 minims.

Not Official.

**TEREBINTHINA VENETA** or **T. LARICIS.**—A viscid liquid of a yellowish or greenish-yellow colour, obtained from *Pinus larix* (*Larix Europœa*). It does not readily harden on exposure to air, or when mixed with $\frac{1}{16}$ of Magnesia. Soluble in Alcohol. It is much used on the Continent.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Trementina di Venezia), Norw., Port., Russ., Span. (Trementina de Alerce), Swed. and Swiss; not in U.S.)

# LAUROCERASI FOLIA.

## CHERRY-LAUREL LEAVES.

The fresh leaves of *Prunus laurocerasus*, Common or Cherry Laurel.

(Belg., Dutch, Fr. (Laurier Cerise), Ital. (Lauroceraso), Port. (Loureiro-Cerejeira) and Span.; not in the others.)

### Preparation.

**AQUA LAUROCERASI.**

Fresh leaves of Cherry-Laurel, 16; Water, 50: chop the leaves, crush them in a mortar, and put them with the Water into a retort: distil 20 of the liquid, shake the product, filter through paper, and adjust the strength of the finished product, either by addition of Hydrocyanic Acid or by diluting the distillate with Distilled Water, so that 810 grs. of it, tested as described in the process for Diluted Hydrocyanic Acid, shall require 150 grain-measures of the volumetric Solution of Nitrate of Silver to be added before a permanent precipitate begins to form, which corresponds to 0·1 per cent. of real Hydrocyanic Acid. Preserve in a stoppered bottle.

Note.—To ascertain if it lost much of its strength by keeping, a sample was taken, which contained ·104 per cent., and placed in a pint bottle about three-quarters full for a month, it then gave ·094 per cent.; the bottle was then kept for a week with only 3 oz. in it, and then gave ·093 per cent.; the same was then kept three days with the cork out, and then gave ·038 per cent.

Notwithstanding the adoption of an Official standard, the strength of this preparation is still very variable, commercial samples half the official strength being very common.

(Austr., Dutch, and Swiss, 1·0 HCN per 1000; Belg., ·5 per 1000; Fr., ·55—·7 per 1000; Span., ·833 per 1000; Port., Leaves, 1 in 2, not standardised; not in the others.)

**Medicinal Properties.**—Sedative. Similar to Hydrocyanic Acid.

**B.P. Dose.**—30 minims to 2 drms.

20 minims = 1 minim Diluted Hydrocyanic Acid.

**Incompatibles.**—Same as Hydrocyanic Acid.

**Antidotes.**—In case of overdose, the antidotes should be as directed under Acidum Hydrocyanicum.

# LAVANDULÆ OLEUM.

## OIL OF LAVENDER.

The oil distilled in Britain from the flowers of *Lavandula vera*.

It is sometimes adulterated with foreign oil from *L. vera*, and the foreign oil is frequently adulterated with Oil of Spike from *L. spicata*. No satisfactory chemical test for purity is known. The flavour is stated to be improved by keeping for a year after distillation, and then mixing with an equal volume of Absolute Alcohol.

This Oil has till lately been looked upon as a mixture of a stearoptene, supposed to be **Borneol,** with 25 per cent. of a lævorotatory terpene and some Resin (*Y.B.P.* '80, 83), but later results show the principal constituent to be an alcohol **Linalool,** $C_{10}H_{18}O$, identical with that obtained from Lignum Aloes, with a smaller proportion of Linalool Acetate (which forms the principal constituent of Oil of Bergamot).—*P.J.* xxii. 894, and *P.J.* xxiii. 867.

Samples of English oil examined by us had sp. g. ·884—·892; samples of foreign oil, ·881—·897. Rotation—4° to —10°.

Messrs. Schimmel state that genuine oil distilled by them had sp. g. ·895.

**Solubility.**—In all proportions of Rectified Spirit and Absolute Alcohol; sparingly soluble in Proof Spirit.

(Austr., Dutch, Ger. and Russ., sp. g. ·885—·895; Belg., sp. g. ·872—·948; Dan., sp. g. ·875—·895; Fr.; Hung., sp. g. ·885—·900; Ital. (Essenza di Lavanda), sp. g. ·876—·880; Norw.; Port. (Essencia de Alfazema), sp. g. ·875—·940; Span. (Esencia de Espliego); Swed.; Swiss, sp. g. ·88—·89; U.S., sp. g. ·885—·897.)

**Medicinal Properties.**—An aromatic stimulant and carminative. Useful in hysteria, hypochondriasis, and other nervous affections, also in flatulence and colic. Rarely given in a crude state. Used as an adjuvant to other medicines.

**Dose.**—1 to 4 minims.

Contained in Linimentum Camphoræ Compositum.

## Preparations.

### SPIRITUS LAVANDULÆ.

Oil of Lavender, 1; Rectified Spirit, 49: dissolve. =(1 in 50).

**Dose.**—30 to 60 minims.

(Belg., Dutch and Russ., 1 in 100; Dan. and Norw., 2 in 100; U.S., 1 in 20; all with the oil, and all by weight except U.S.; Austr., Ger., Port., Swed. and Swiss, from the flowers; not in the others.)

### TINCTURA LAVANDULÆ COMPOSITA. *B.P.Syn.* — SPIRITUS LAVANDULÆ COMPOSITUS.

Oil of Lavender, 90 minims; Oil of Rosemary, 10 minims; Cinnamon Bark, bruised, 150 grs.; Nutmeg, bruised, 150 grs.; Red Sandal-wood, 300 grs.; Rectified Spirit, 40 oz.: macerate the Cinnamon, Nutmeg, and Red Sandal-wood in the Spirit for seven days, then press out and strain; dissolve the Oils in the strained tincture, filter, and add sufficient Rectified Spirit to make 40 oz.

Or Spirit of Lavender, 30; Spirit of Rosemary, 3⅛; Cinnamon, 1; Nutmeg, 1; Red Sanders, 2; Rectified Spirit, to make 128.

**Dose.**—½ to 2 drms.

Used to colour Liq. Arsenicalis.

(Swed., similar to Brit.; U.S., similar to Brit. but stronger; Dan. (Tinct. Lavand. Rubr.) and Norw. differ considerably from Brit.; not in the others.)

## Not Official.

## LEPTANDRA U.S.

(CULVERS ROOT.)

The rhizome and rootlets of *Veronica Virginica.*

A cathartic, and stimulates the secretion of bile.

An Alcoholic **Extract**, dose 2 to 4 grains, and **Fluid Extract** (1 in 1), dose 20 to 60 minims, are both official in U.S.P.

**Leptandrin.**—An eclectic remedy, used as an alterative, ¼ to ½ grain; as a purgative, 2 to 4 grains.

# LIMONIS CORTEX.

LEMON PEEL.

*B.P.Syn.*—LIMONIS PERICARPIUM.

The outer part of the rind or pericarp of the fresh fruit of *Citrus Limonum.*

(Austr., Belg., Fr. (Citron), Ger., Hung., Ital. (Cedro), Port. (Limao), Russ., Span., Swed., Swiss and U.S.; not in Dan., Dutch or Norw.)

**Medicinal Properties.**—An aromatic flavouring agent. Added to stomachic tinctures and infusions. Particularly applicable to dyspepsia.

Contained in Inf. Aurant. Comp. and Inf. Gentian. Comp.

## Preparations.

### OLEUM LIMONIS.

A volatile Oil obtained by mechanical means from Fresh Lemon Peel.

Contains about 90 per cent. of terpenes (mostly Limonene). The flavour being due to an aldehyde, present to the extent of 4 to 8 per cent., and known commercially as **Citral.** *See* p. 338.

**Solubility.**—In all proportions of Glacial Acetic Acid and Absolute Alcohol; 1 in 12 of Rectified Spirit.

Stimulant and carminative. Chiefly used, however, to impart flavour to other medicines. Externally, stimulant and rubefacient.

Its flavour and aroma suffer much from keeping; it keeps the aroma much better if mixed (when fresh) with 10 per cent. (by measure) of Absolute Alcohol.

When this has been done by the seller, it can readily be detected by the diminution in volume of the Oil on shaking with Water.

The Oil should evaporate from paper without leaving a stain.

**Dose.**—1 to 4 minims.

(Austr. (sp. g. ·850); Belg., Essentia Citri (sp. g. ·847—·868); Dan. (sp. g. ·84—·86), and Norw., Aetheroleum Citri; Swed., Aetheroleum Cedro; Dutch (sp. g. ·840—·855), Ger., Hung. (sp. g. ·840—·870), Russ. (sp. g. ·840—·847), and Swiss (sp. g. ·85—·86), all Oleum Citri; Fr., Huile volatile de Citron; Ital., Essenza di Corteccia di Cedro (sp. g. ·850); Port., Essencia de Limao (sp. g. ·846—·856); Span., Esencia de Limon; U.S., Oleum Limonis (sp. g. ·858—·859).)

Contained in Lin. Potass. Iod. cum Sapone, Mistura Olei Ricini, and Spiritus Ammoniæ Aromaticus.

### SYRUPUS LIMONIS.

Fresh Lemon Peel, 2; Lemon Juice, strained, 20; Refined Sugar, 36. Heat the Lemon Juice to the boiling point, and having put it into a covered vessel with the Lemon Peel, let them stand until they are cold, then filter and dissolve the Sugar in the filtered liquid with a gentle heat. The product should weigh 56 and the sp. g. be about 1·340.

=(2 Peel and 20 Juice in 41).

This is not an example of "Elegant Pharmacy;" it is frequently turbid, and prone to separation of Sugar. The sp. g. should be reduced, say, to 1·330.

**Dose.**—1 to 2 drms.

(Austr., Syrupus Citri, fresh Lemon Juice filtered 10, Sugar 16; Ital., Bruised Peel 2, Sugar 19, Distilled Lemon Water, 12; Port., Xarope de Casca de Limao, fresh Lemon Peel 1, Boiling Water 35, Sugar 65; Span., Jarabe de Limon, Lemon Juice 5, Sugar 9. For other Pharmacopœias *see* Acidum Citricum.)

### TINCTURA LIMONIS.

Fresh Lemon Peel, cut small, 1; Proof Spirit, 8: macerate for seven days in a closed vessel with occasional agitation, strain, press, filter, and make up (if necessary) with Proof Spirit to 8. =(1 in 8).

**Dose.**—½ to 2 drms.

(Belg. and Dutch (Spiritus Citri), 1 Oil in 100; Fr. (Alcoolature de Citron), 1 fresh Peel to 2 of Alcohol; and (Teinture d'essence de Citron), 1 Oil in 50; Span. (Alcohol de Corteza de Limon), Peel 1, and Alcohol (80 p. c.) 6, distil; Swiss (Spiritus Citri), fresh Peel, with Alcohol, and Water; all by weight: U.S. (Spiritus Limonis), Oil of Lemon 5, Lemon Peel 5, Deodorized Alcohol to measure 100; not in the others.)

### Not Official.

**CITRAL.**—The high boiling point fractions in distilling Lemon Oil, having a flavouring power about 15 times as great as the original Oil.

Sp. g. about ·900; boiling point 220°—240° C. The bulk of Lemon Oil distils between 170° and 180° C.

It has the formula $C_{10}H_{16}O$, gives the aldehyde reactions with Bisulphites, and corresponds with the alcohol **Geraniol** (identical with **Linalool**).

It may be used to increase the flavour of Oil of Lemon, by mixing it with the latter, in the proportion of 1 to 14.

## LIMONIS SUCCUS.

### LEMON JUICE.

The freshly expressed juice of the ripe fruit of *Citrus Limonum.*

A slightly turbid yellowish liquid, with a sharp acid taste. Sp. g. 1·035—1·045. Quantity of Citric Acid in a fluid ounce is 36 to 46 grs.

Lemon Juice is extremely liable to fermentation, and requires the addition of 30 per cent. of Proof Spirit (or its equivalent) to keep it.—*P.J.* xiii. 607.

Lemon Juice is rather a variable quantity, but it is generally understood that the Official standard is too high for an average by about 5 grs. per ounce.

The most recent analyses (*P.J.* xxi. 611) show a maximum of acidity (42 grs.) in December gradually diminishing to 32 grs. in August with a more rapid rise to the next maximum.

It not unfrequently happens that during summer the acidity falls much below the average figures.

The neutralising quantities for effervescing mixtures are given under Acidum Citricum.

(Fr.; Span., Zumo de Limon; U.S., about 7 p.c. of Citric Acid, ·5 p.c. of ash; Swiss, Succus Citri facticius, Citric Acid 10, Water 89, Spirit of Lemon 1.)

**Medicinal Properties.**—Refrigerant; when diluted, a useful beverage in scurvy and in febrile and inflammatory affections.

In acute Rheumatism, ½ to 1 pint daily.

**Dose.**—½ to 2 oz.

Contained in Syrupus Limonis.

### Preparation.

ACIDUM CITRICUM.—*See* ACIDUM CITRICUM.

# LINIMENTA.

## LINIMENTS.

Under this heading are placed external applications, which are usually applied by rubbing or painting, or on piline, to produce local stimulation or to relieve pain.

The following are the Liniments of the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared :—

| | | Proportion of the active ingredient to the whole. |
|---|---|---|
| LINIMENTUM ACONITI | | 1 in $1\frac{1}{2}$. |
| LINIMENTUM AMMONIÆ | Solution of Ammonia. | 1 in 4. |
| LINIMENTUM BELLADONNÆ | | 1 in $1\frac{1}{2}$. |
| LINIMENTUM CALCIS | Solution of Lime. | 1 in 2. |
| LINIMENTUM CAMPHORÆ | | 1 in 5. |
| LINIMENTUM CAMPHORÆ COMP. | Strong Ammonia. | 1 in $4\frac{1}{2}$. |
| LINIMENTUM CHLOROFORMI | | 1 in 2. |
| LINIMENTUM CROTONIS | | 1 in 8. |
| LINIMENTUM HYDRARGYRI | Mercury | 1 in 6. |
| LINIMENTUM IODI | Iodine about | 1 in 9. |
| LINIMENTUM OPII | Tinct. Opii | 1 in 2. |
| LINIMENTUM POTASSII IODIDI CUM SAPONE | about | 1 in 9. |
| LINIMENTUM SAPONIS | | 1 in 10. |
| LINIMENTUM SINAPIS COMP. | Oil of Mustard | 1 in 40. |
| LINIMENTUM TEREBINTHINÆ | | 1 in $1\frac{1}{4}$. |
| LINIMENTUM TEREBINTHINÆ ACETICUM | | 1 in $2\frac{1}{4}$. |

# LINI FARINA.

## LINSEED MEAL.

The dried ripe seeds of *Linum usitatissimum* reduced to powder.

Lini Farina of former Pharmacopœias was the cake of Linseed, from which the oil had been pressed, reduced to powder; but B.P. 1885 applies the term to what has been known as "crushed Linseed."

As there is a difference of opinion in the medical profession as to which of these is the best for making a poultice, it is unfortunate that the old term is now applied to something different. Both kinds might have been Official under different names.

(Belg. and Fr. should contain 30 per cent. of oil; Ital., 30 per cent. of oil; Port., U.S. not less than 25 per cent. of oil; not in the others.)

Used in the preparation of the Cataplasms of the Pharmacopœia, except Cataplasma Fermenti.

### Preparation.

**CATAPLASMA LINI.**

Linseed Meal, 4; boiling Water, 10: mix the Linseed Meal with the Water gradually, with constant stirring.

Now made with Linseed Meal (containing the oil) in place of the old Meal (without its oil) and Olive Oil. The former, if fresh, is preferable.

Applied to inflamed and suppurating parts.

(Belg., Fr., Port. and Span.; not in the others.)

# LINI SEMINA.

## LINSEED.

*N.O.Syn.*—FLAX SEED.

The dried ripe seeds of *Linum usitatissimum.*

The envelope or testa abounds in a peculiar gummy matter or mucilage, readily imparted to hot Water.

**Test.**—A decoction of Linseed when cold does not become blue on the addition of Solution of Iodine.

Samples of Pulvis Lini (without oil) frequently show the presence of starch by this test.

(Austr., Belg., Dan., Dutch, Fr. (Lin), Ger., Hung., Ital., Norw., Port. (Linho), Russ., Span. (Lino), Swed., Swiss and U.S.)

**Medicinal Properties.**—Demulcent and emollient. Employed in catarrh, dysentery, nephritic and calculous complaints, and inflammatory affections of the mucous membranes and urinary passages.

### Preparations.

**INFUSUM LINI.**

Linseed, 150 grs.; dried Liquorice Root, in No. 20 powder, 50 grs.; boiling Distilled Water, 10 oz.: infuse two hours, and strain. =(about 1 in 30).

(Fr., Linseed 1, boiling Water 100; Swed., twice the strength of Brit.; not in the others.)

**Incompatibles.**—Preparations of Lead and Iron, and most metallic salts.

**OLEUM LINI.**

The Oil expressed in Britain from Linseed without heat.

Sp. g. about ·935; does not congeal above −0·4° F. (—18° C.).

**Solubility.**—Of a freshly expressed sample, 1 in 40 of Absolute Alcohol; 1 in 1¼ of Ether.

(Belg. sp. g. ·930; Dan., Dutch, and U.S. (sp. g. ·930—·940); Fr., Ger., Hung., and Russ. (sp. g. ·936—·940); Hung. also Oleum Lini Lotum; Ital. (sp. g. ·935); Norw.; Port., Oleo de Linhaça (sp. g. ·930); Span., Aceite de Linaza; Swed.; Swiss; not in Austr.)

As an **enema** a pint of Linseed Oil thrown up removes impacted fæces with less pain and spasm than gruel or other aqueous enemata.

Linseed Oil, when issuing from the seed whilst pressing, has scarcely any of the odour or taste of the Linseed Oil of the shops, but acquires it in a very short time by exposure to the air. For medicinal purposes it should be procured as fresh as possible.

Boiled Linseed Oil is used in the Arts as a drying oil, and for certain purposes Litharge is added during the boiling. The *boiled* oil may, therefore, contain Lead.

### Not Official.

**CARRON OIL.**—Equal parts of Linseed Oil and Lime Water, shaken to form a cream.

One of the best **applications** to burns or scalds.

# LIQUORES.

## SOLUTIONS.

The following are the Solutions of the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared :—

| | Proportions of active ingredient to the whole. | |
|---|---|---|
| LIQUOR ACIDI CHROMICI | Chromic Acid. | 1 in 3½. |
| LIQUOR AMMONIÆ | Liquor Fort. | 1 in 3. |
| LIQUOR AMMONIÆ FORTIOR | Ammonia. | 1 in 3. |
| LIQUOR AMMONII ACETATIS | Liquor Fort. | 1 in 5. |
| LIQUOR AMMONII ACETATIS FORTIOR. | Ammon. Acet. | 1 in 2·8. |
| LIQUOR AMMONII CITRATIS | Liquor Fort. | 1 in 4. |
| LIQUOR AMMONII CITRATIS FORTIOR | Ammon. Cit. | 1 in 1·74. |
| LIQUOR ANTIMONII CHLORIDI | Antim. Chlor. | 1 in 1·8. |
| LIQUOR ARSENICALIS | Arsenious Acid. | 1 in 100. |
| LIQUOR ARSENICI HYDROCHLORICUS | Arsenious Acid. | 1 in 100. |
| LIQUOR ARSENII ET HYDRARGYRI IODIDI | Arsenious Iodide. | 1 in 100. |
| LIQUOR ATROPINÆ SULPHATIS | Atrop. Sulph. | 1 in 100. |
| LIQUOR BISMUTHI ET AMMON. CITRAT | Bism. Cit. | 1 in 10. |
| LIQUOR CALCII CHLORIDI | Calc. Chlor. Anhyd. | 1 in 5⅓. |
| LIQUOR CALCIS | Lime. | 5 gr. in 10 oz. |
| LIQUOR CALCIS CHLORINATÆ | Calx Chlorinat. | 1 in 10. |
| LIQUOR CALCIS SACCHARATUS | Lime. | 1 in 65. |
| LIQUOR CHLORI | Chlorine. | 1 in 167. |
| LIQUOR COCAINÆ HYDROCHLORATIS | | 1 in 10. |
| LIQUOR EPISPASTICUS | Cantharides. | 1 in 4. |
| LIQUOR FERRI ACETATIS | Liquor Fort. | 1 in 4. |
| LIQUOR FERRI ACETATIS FORTIOR | Ferric Oxide. | 1 in 9·4. |
| LIQUOR FERRI DIALYSATUS | Ferric Oxide. | 1 in 20. |
| LIQUOR FERRI PERCHLORIDI | Liquor Fort. | 1 in 4. |
| LIQUOR FERRI PERCHLORIDI FORTIOR | Ferric Oxide. | 1 in 3·5. |
| LIQUOR FERRI PERNITRATIS | Ferric Oxide. | 1 in 20·8. |
| LIQUOR FERRI PERSULPHATIS. | Ferric Oxide. | 1 in 4·7. |
| LIQUOR GUTTA PERCHA | Gutta Percha. | 1 in 8. |
| LIQUOR HYDRARGYRI NITRATIS ACIDUS | Mercury. | 1 in 1·5. |
| LIQUOR HYDRARGYRI PERCHLORIDI | Hyd. Perchlor. | 1 in 875. |
| LIQUOR IODI | Iodine. | 1 in 20. |
| LIQUOR LITHIÆ EFFERVESCENS | Lithii Carb. | 5 grs. in 10 oz. |
| LIQUOR MAGNESII CARBONATIS | Mag. Carb. | 10 grs. in 1 oz. |
| LIQUOR MAGNESII CITRATIS | Mag. Carb. | 10 grs. in 1 oz. |
| LIQUOR MORPHINÆ ACETATIS | Morph. Acet. | 1 in 100. |
| LIQUOR MORPHINÆ BIMECONATIS | Morph. Bimec. | 1 in 80. |
| LIQUOR MORPHINÆ HYDROCHLORATIS | Morph. Hydro. | 1 in 100. |
| LIQUOR MORPHINÆ SULPHATIS | Morph. Sulph. | 1 in 100. |
| LIQUOR PLUMBI SUBACETATIS | Plumbi Subacet. | 1 in 4. |
| LIQUOR PLUMBI SUBACETATIS DILUTUS | Liquor. | 1 in 80. |
| LIQUOR POTASSÆ | Hydrate of Potassium. | 1 in 17. |
| LIQUOR POTASSÆ EFFERVESCENS | Pot. Bicarb. | 15 grs. in 10 oz. |
| LIQUOR POTASSII PERMANGANATIS. | Pot. Permang. | 1 in 100. |

| | | Proportions of active ingredient to the whole. |
|---|---|---|
| LIQUOR SODÆ | Hydrate of Sodium. | 1 in 25. |
| LIQUOR SODÆ CHLORINATÆ | Chlorine. | 1 in 40. |
| LIQUOR SODÆ EFFERVESCENS. | Sodii Bicarb. | 15 grs. in 10 oz. |
| LIQUOR SODII ARSENIATIS | Sod. Arsen. Anhyd. | 1 in 100. |
| LIQUOR SODII ETHYLATIS | Sodium. | 1 in 20. |
| LIQUOR STRYCHNINÆ HYDROCHLORATIS. | Strychnine. | 1 in 100. |
| LIQUOR TRINITRINI | Nitroglycerine. | 1 in 100. |
| LIQUOR ZINCI CHLORIDI | Zinci Chlorid. | 1 in 1·2. |

Liquors not official will be found in the Index.

Not Official.

## LITHIUM.

LITHIUM.

L, eq. 7.

A silver-white, brilliant, ductile metal, having the density of 0·59, being therefore the lightest metal known, if not the lightest known solid.

It is obtained from several minerals—Petalite, Lepidolite, Triphane, and formerly Triphylline.

The symbol L is used in the B.P., but it is more commonly written Li.

The Carbonate and Citrate are the official preparations.

Lithium Salts are characterized by communicating a crimson colour to a bunsen flame, or, with the addition of Hydrochloric Acid, to a spirit flame.

Not Official.

## LITHII BENZOAS.

BENZOATE OF LITHIUM.

$L\ C_7H_5O_2$, eq. 128.

A white powder or small shining scales, with a faintly acid reaction; the taste is sweet and somewhat saline.

It can be prepared by boiling in Water, 3 of Carbonate of Lithium with 9 of Benzoic Acid, and evaporating.

**Solubility.**—1 in 2½ of Water; 1 in 15 of Rectified Spirit.

(Fr., Russ. and U.S.; not in the others.)

**Medicinal Properties.**—A remedy for gout.

**Dose.**—15 to 30 grs.

Not Official.

## LITHII BROMIDUM.

L Br, eq. 87.

A white granular deliquescent salt.

**Solubility.**—1 in 1 of Water; 1 in 4 of Rectified Spirit.

(Fr., Russ. and U.S.; not in the others.)

**Medicinal Properties.**—Owing to the low atomic weight of Lithium, this salt contains more Bromide than the Bromides of Potassium or Sodium, and consequently has been recommended as a hypnotic for gouty patients.—*M.P.* '88, i. 606.

Has been used in epilepsy.

# LITHII CARBONAS.

CARBONATE OF LITHIUM.

$L_2CO_3$, eq. 74.

In white powder or in minute crystalline grains, alkaline in reaction, soluble in 150 parts of cold Water; insoluble in Alcohol.—*Brit. Pharm.*

**Solubility.**—The Lithium Carbonate solubility as given in B.P. '67, was 1 in 100. *P.G.* i. '72, and U.S.P. '80, both gave 1 in 150, followed by *P.G.* ii. '82, with not less than 100. B.P. '85, changed the 100 to 150. *P.G.* iii. '90, dropped it to 80. All more recent experiments agree in a solubility about 1 in 70 at 60° F.; in hot Water it is only soluble to about half this extent, a solution saturated in the cold becoming quite turbid on boiling. It should be noticed that using 1 part of Lithium Carbonate to 70 parts of Water solution is very slow, and using these proportions in ounces it requires several weeks' digestion, with frequent shaking, before complete solution is effected.

**Tests.**—It dissolves in Hydrochloric Acid; this solution, evaporated to dryness, leaves a residue of Chloride of Lithium, which communicates a red colour to the flame of a spirit lamp, and redissolved in Water yields a precipitate with Phosphate of Sodium. 10 grains of the salt neutralised with Sulphuric Acid, and afterwards heated to redness, leave 14·86 grains of dry Sulphate of Lithium, which, when redissolved in Distilled Water, yield no precipitate with Oxalate of Ammonium or Solution of Lime—indicating absence of Lime, Magnesia, and Alumina.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., Swed., Swiss and U.S.; not in Norw.)

**Medicinal Properties.**—Lithium, combined with Carbonic Acid, given in a diluted solution, as in Lithia Water, acts as a powerful diuretic, probably more so than the corresponding Salts of Potassium or Sodium. In certain states of the system in which Urate of Sodium is liable to be deposited in the tissues, leading to the production of gouty inflammation, the administration of Lithium Salts is attended with advantage, probably by aiding elimination, and likewise by assisting the solution of the Urate in the animal fluids. Urate of Lithium is fairly soluble; Lithium salts are therefore most useful when Uric Acid abounds in the urine. Externally as a **lotion**, 5 grains in an ounce of Water, to gouty inflamed parts.

1 grain of Carbonate of Lithium and 1 grain Arseniate of Sodium given in aërated Water has been recommended by Martineau in the treatment of diabetes.—*L.* '87, i. 650.

**Dose.**—3 to 6 grs. in 3 or 4 oz. of aërated Water.

## Preparation.

**LIQUOR LITHIÆ EFFERVESCENS.** *B.P.Syn.*—Lithia Water.

Ten ounces contains 5 grains of Carbonate of Lithium.

**Dose.**—5 to 10 oz.

## LITHII CITRAS.

CITRATE OF LITHIUM.

$L_3C_6H_5O_7$, $4H_2O$, eq. 282.

A white crystalline salt, made by dissolving 50 grains of Carbonate of Lithium in 1 oz. of Water with 90 grains of Citric Acid, then concentrating for crystals to form.

The theoretical quantity of Citric Acid is 94·6. The salt when pure is not deliquescent.

**Solubility.**—1 in 2 of Water; almost insoluble in Rectified Spirit.

The solubility in Water is variously given as 1 in 5 to 1 in 25.

**Tests.**—Heated to redness it blackens, evolving inflammable gases; and the residue neutralised by Hydrochloric Acid, yields with Rectified Spirit a solution which burns with a crimson flame. 20 grains of the salt dried at 212° F. (100° C.) lose about 3·8 grains, at 240° F. (115·5° C.) an additional 1·3 grains, and burned at a low red heat, with free access of air, leave 7·8 grains of a white residue.

To ensure the whole of the residue being Carbonate, it is better, before weighing, to drench it with solution of Carbonate of Ammonium and gently re-ignite.

(Fr. and U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Similar to those of the Carbonate, but the Citrate being more soluble, it is better adapted for fluid administration.

**Dose.**—5 to 10 grs.

Not Official.

## LITHII GUAIACAS.

Is prepared by digesting pure Guaiacum Resin in an aqueous solution of Lithia, decanting the clear solution, evaporating and scaling it.

Composed of Lithia, 1; Guaiacum Resin, 3.

This salt, introduced by Sir Alfred Garrod, is given for chronic gout and some forms of rheumatism.

**Dose.**—5 grs. twice a day.

The Author is indebted to Mr. Sandford for this information.

Not Official.

## LITHII SALICYLAS.

A deliquescent white or greyish-white powder with a faintly acid reaction.

**Solubility.**—4 in 3 of Water; 1 in 2 of Rectified Spirit.

**Tests.**—Its aqueous solution should not effervesce on the addition of an acid (absence of Carbonate). When agitated with 15 parts of concentrated Sulphuric Acid, the salt should not impart any colour to the acid in fifteen minutes (absence of foreign organic matter). Hydrochloric or Sulphuric Acid produces in the aqueous solution a voluminous precipitate of Salicylic Acid, which when separated and washed, should conform to the reactions and tests given under Acidum Salicylicum.

(Fr., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—A remedy for gout and rheumatism.

Is much better than Salicylate of Sodium in chronic articular rheumatism.—*B.M.J.* '86, i. 38; '87, i. 695.

**Dose.**—10 to 30 grains.

# LOBELIA.

## LOBELIA.

The herb *Lobelia inflata* in flower, dried.

Imported from North America.

It contains about ·3 per cent. of a non-volatile alkaloid, **Lobeline,** a volatile oil, a fixed oil, and a stearoptene called "Inflatine"; the alkaloid is a powerful emetic.

In the Tincture or an aqueous solution of the drug, the alkaloid is destroyed by heat. When evaporation is required the solution must be acidified (*P.J.* xvii. 1037; also xviii. 135); but Wright and Farr repeatedly exposed their pure alkaloidal residue to 100° C. without loss of weight, and it continued to give the usual alkaloidal reactions.—*C.D.* '93, i. 454.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Swed., Swiss and U.S.; not in Span.)

**Medicinal Properties.**—In small doses it is antispasmodic, diaphoretic, and expectorant. More freely used, it is cathartic and emetic; but as an emetic it is too distressing as well as too hazardous for general use, as it has a powerful effect on the respiration, and may cause death. It is chiefly used in spasmodic asthma, also in catarrh and other laryngeal and pectoral affections, severe croup, and for the paroxysmal dyspnœa of chronic bronchitis. In some cases a useful adjunct to diuretics.

**Antidotes.**—In case of poisoning by Lobelia, the most active stimulants, internal as well as external, should be employed. Tannic Acid, Gallic Acid or strong tea frequently repeated, warmth to the surface, recumbent position important.

### Preparations.

### TINCTURA LOBELIÆ.

Lobelia, in No. 40 powder, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator, and let it drain, pour on the remaining Spirit, and when it ceases to drop, press the marc, filter, and add Proof Spirit to make 8.

=(1 in 8).

**B.P.Dose.**—10 to 30 minims; but 1 drm. may be given for dyspnœa.

Wright and Farr (*C.D.* '93, i. 454) conclude that extraction of alkaloid depends very little upon strength of Spirit, and reckon 50 per cent. (by volume) Alcohol to be the least objectionable. Details of estimation process are given, and the figures show the tincture to vary between ·027 and ·044 (average ·038) per cent. of alkaloid =·3 per cent. for average drug.

(Austr., Dan., Dutch, Ger., Ital., Norw., Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Port. and U.S., 1 in 5; all by weight except U.S.; not in Span.)

### TINCTURA LOBELIÆ ÆTHEREA.

Lobelia, in coarse powder, 1; Spirit of Ether, 8: macerate seven days, press, filter, and add sufficient Spirit of Ether to make 8.

=(1 in 8).

**Dose.**—10 to 30 minims as an antispasmodic.

(Not in the other Pharmacopœias.)

# LUPULINUM.

## LUPULIN.

*N.O.Syn.*—Glandulæ Lupuli.

A glandular brownish-yellow resinous powder, obtained from the dried strobiles of *Humulus Lupulus*.

**Tests.**—Not more than 30 or 40 per cent. should be insoluble in Ether. On incineration it should not leave more than 15 per cent. of ash.—*Brit. Pharm.*

Should not leave more than 10 per cent. of ash.—*U.S.*

The ash of eight samples, as determined by us, gave 28·2, 33·8, 29·9, 27·9, 20·6, 12·1, 18·7, 25·4 per cent.

(Austr., Belg., Dan., Dutch, Fr., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.; now omitted from Ger.)

**Medicinal Properties.**—Aromatic, tonic, sedative, and anaphrodisiac. It allays irritability of the bladder.

**Dose.**—2 to 5 grs.

### Not Official.

**EXTRACTUM LUPULINI.**—Exhaust Lupulin with Rectified Spirit, and evaporate the strained liquor to a proper consistence. The extract produced is about half the original weight of the Lupulin employed.

**Dose.**—1 to 5 grs.

**EXTRACTUM LUPULINI FLUIDUM** (*U.S.*).—Prepared with Alcohol (sp. g. ·820), so that 1 fl. oz. represents 1 oz. of Lupuline.

**OLEORESINA LUPULINI** (*U.S.*).—Exhaust Lupulin with Stronger Ether; distil most of the Ether on a water-bath, and complete by exposure to the air.

**Dose.**—1 to 5 grs.

**TINCTURA LUPULINI.**—Lupulin, 1; Rectified Spirit, 6; macerate till exhausted, pour on a filter, and when drained wash with Rectified Spirit to make 8.

**Dose.**—15 to 60 minims.

# LUPULUS.

## HOP.

*B.P.Syn.*—Humulus. *N.O.Syn.*—Fructus Lupuli. Strobili Lupuli.

The dried strobiles of *Humulus Lupulus*, from plants cultivated in England.

The ethereal extract obtained from Hop varies from 9 to 15 p.c., and consists of oil, resin, and bitter principle.

(Belg., Fr. (Houblon), Norw., Port., Span., Swed., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Tonic, stomachic, sedative, and moderately narcotic. It allays irritation of the genito-urinary organs. Has been recommended in the treatment of alcoholism. It sometimes produces sleep when opiates are objectionable. Hops may be used topically as fomentation or poultice, as a resolvent or discutient in painful swellings and tumours. Hop (which has been carefully dried and preserved) is made into a pillow, to induce sleep.

**Incompatibles.**—Mineral acids, metallic salts.

## Preparations.

### EXTRACTUM LUPULI.

Hop, 8; Rectified Spirit, 15; Distilled Water, 80: macerate the hop in the Spirit for seven days, press out the tincture, filter, and distil off the Spirit, leaving a soft extract; boil the residual Hop with the Water for one hour, then press out the liquor, strain, and evaporate by a water-bath to the consistence of a soft extract; mix the two extracts, and evaporate, at a temperature not exceeding 140° F. (60° C.), to a pill consistence.

1 lb. Hop yields 4 to 5 oz. Extract.

**Dose.**—5 to 15 grains.

(Belg., Fr., Port. and Span., have alcoholic Extracts, but not made the same way as Brit.; U.S. has a **Fluid Extract** from Lupulin; not in the others.)

### INFUSUM LUPULI.

Hop, 1; boiling Distilled Water, 20: infuse one hour, and strain.

**Dose.**—1 to 2 oz. =(1 in 20).

(Fr., 1 in 100; not in the other Pharmacopœias.)

### TINCTURA LUPULI. *N.O.Syn.*—Tinctura Humuli.

Hop, 1; Proof Spirit, 8: macerate forty-eight hours in 6 of the Spirit, agitating occasionally, pack in a percolator, let it drain, add to it the remaining Spirit, and when the fluid ceases to drop, press, filter, and add Proof Spirit to make 8. =(1 in 8).

**Dose.**—$\frac{1}{2}$ to 2 drms.

(Belg., Swed. and U.S. 1 in 5; not in the others.)

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Not Official.

## LYCOPODIUM.

The spores of *Lycopodium clavatum* and other species of *Lycopodium;* a fine powder, pale yellowish, very mobile, inodorous, tasteless, floating upon Water and not wetted by it, but sinking on being boiled with it, and burning quickly when thrown into a flame.

Lycopodium should be free from pollen, starch, sand, and other impurities, any of which are easily detected by the microscope.

When ignited with free access of air, it should not leave more than 5 per cent. of ash. It has been used in dispensing chiefly as powder to envelop hygroscopic pills, but has been recommended in this country for incontinence of urine, in the form of **Tincture.** Dose, 15 to 60 minims.—*L.* '87, ii. 605; *B.M J.* '90, ii. 1246.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

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Not Official.

## MAGNESIUM.

MAGNESIUM.

Mg, eq. 24.

Magnesium, the metallic base of Magnesian Salts, does not exist native. It may be obtained artificially. When set on fire it produces a powerful actinic light, and is used by photographers on this account.

It is a brilliant grey metal (sp. g. 1·750), slightly resembling Silver, malleable, fusible at a low temperature, and convertible into Magnesia by the combined action of air and moisture.

It is preferable to Zinc for Marsh's test, and particularly when Arsenic-free Zinc is not obtainable.

Sulphate of Magnesium was first artificially obtained in England by Dr. Crew in 1675, by evaporation from the water of Epsom spring (whence the name of Epsom Salts). The chief source of the Magnesia now sold is Magnesian Limestone, Double Carbonate of Magnesium and Calcium, called Dolomite, and is obtained by a process discovered by Dr. Henry, of Manchester. Magnesia was first chemically distinguished from Lime by Dr. Black, in 1755, who also showed the difference between Magnesia and its Carbonate. From the mode of procuring it, it is frequently termed Calcined Magnesia.

There are two kinds of Magnesia admitted into the Pharmacopœia, the Heavy and the Light. The former is that which is commonly used in pharmacy, it being smoother, more readily miscible with Water, and more compact. It is probably from these causes that it is preferred in medicine, and in the Pharmacopœia it is clearly meant to be used, unless the Light is expressly ordered.

The forms in which Magnesia is used are:—Magnesia Levis, Magnesia Ponderosa, Magnesii Carbonas Levis, Magnesii Carbonas Ponderosa, and Magnesii Sulphas.

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## MAGNESIA LEVIS.

### LIGHT MAGNESIA.

*B.P.Syn.*—LIGHT CALCINED MAGNESIA; OXIDE OF MAGNESIUM.

$MgO$, eq. 40.

Light Carbonate of Magnesium, exposed to a low red heat, in a Cornish or Hessian crucible closed loosely by a lid, until a small quantity taken from the centre of the crucible, cooled, moistened with Water and dropped into warm diluted Sulphuric Acid causes no effervescence.

A bulky white powder, differing from Magnesia Ponderosa (heavy Magnesia) only in its great levity, the volumes corresponding to the same weight being in the ratio of 3½ to 1.

**Test.**—Does not effervesce with Acids.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Dose.**—10 to 20 grs. as an antacid; 20 to 60 grs. as a purgative.

Contained in Pulvis Rhei Compositus.

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## MAGNESIA PONDEROSA.

### HEAVY MAGNESIA.

*B.P.Syn.*—HEAVY CALCINED MAGNESIA; OXIDE OF MAGNESIUM.

$MgO$, eq. 40.

Heavy Carbonate of Magnesium, heated in a Cornish or Hessian crucible as described under Magnesia Levis.

It is a white powder, scarcely soluble in Water, but readily dissolved by Acids without effervescence.

**Solubility.**—1 in about 6000 of cold Water, 1 in about 36000 of hot Water; like Lime, it is more soluble in cold than in hot Water.

**Tests.**—Its solution in Hydrochloric Acid, when neutralised by a mixed solution of Ammonia and Chloride of Ammonium, gives a copious crystalline precipitate when Phosphate of Sodium is added to it. Dissolved in Nitric Acid and neutralised with a mixture of Ammonia and Chloride of Ammonium, it does not give any precipitate with Oxalate of Ammonium or Chloride of Barium—indicating absence of Lime and Sulphates.

(Norw. and Swed., Oxydum Magnesicum ponderosum; U.S.; not in the others.)

**Medicinal Properties.**—Antacid, alterative, laxative, and antilithic. Much used in dyspepsia, heart-burn, sick headache, gout, and other complaints attended with acidity, and constipation. It is preferable as an antacid to Bicarbonate of Sodium. As a laxative, it may often be used with advantage when other medicines occasion nausea; generally combined with other purgatives. It is an excellent and mild purgative for children.

It frequently becomes aggregated into a solid mass when prescribed in mixtures, especially when prescribed with the Sulphate.

**Dose.**—10 to 20 grs. as an antacid and alterative, 20 to 60 grs. as a purgative.

Although the heavy powder is preferred by many for its smoothness, the light powder is said to be quicker in its action.

Permitted in Pulvis Rhei Compositus.

**Incompatibles.**—All acids.

## MAGNESII CARBONAS LEVIS.

### LIGHT CARBONATE OF MAGNESIUM.

$(MgCO_3)_3\ Mg(HO)_2,\ 4H_2O$, eq. 382.

A very light powder, precipitated cold from a diluted solution of Sulphate of Magnesium by Carbonate of Sodium, the precipitate being washed in boiling Water until the washings do not precipitate with Chloride of Barium, is then dried at 212° F. (100° C.). When examined under the microscope, it is found to be partly amorphous, with numerous slender prisms intermixed. In other respects it is similar to Magnesii Carbonas Ponderosa.

One ounce occupies about the space of 6 ounces of Water.

**Solubility.**—1 in 2500 of cold Water, 1 in 9000 of hot Water.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Dose.**—10 to 20 grs. as an antacid; 30 to 60 grs. as a purgative.

Used in the preparation of Vapor Olei Pini Sylvestris.

## MAGNESII CARBONAS PONDEROSA.

HEAVY CARBONATE OF MAGNESIUM.

$(MgCO_3)_3$, $Mg(HO)_2$, $4H_2O$, eq. 382.

A white powder, precipitated from a boiling concentrated solution of Sulphate of Magnesium by a solution of Carbonate of Sodium, the whole evaporated to dryness, and the dry residue digested in Water and collected on a filter and washed, so that the Sulphate of Sodium is entirely washed out; it is then dried at 212° F. (100° C.).

**Tests.**—Dissolves readily with effervescence in the diluted mineral Acids, yielding solutions which when first treated with Chloride of Ammonium, are not disturbed by the addition of an excess of Solution of Ammonia, but yield a copious crystalline precipitate upon the addition of Phosphate of Sodium. With excess of Hydrochloric Acid it forms a clear solution, in which Chloride of Barium causes no precipitate—indicating absence of Sulphuric Acid. Another portion of the solution, supersaturated with Ammonia, gives no immediate precipitate with Oxalic Acid—indicating absence of Lime. 50 grains calcined at a red heat are reduced to 22.

Commercial samples sometimes contain a considerable proportion of Chloride.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—Same as those given under Magnesia Ponderosa.

**Dose.**—10 to 20 grs. as an antacid; 30 to 60 grs. as a purgative.

Contained in Trochisci Bismuthi.

### Preparation.

**LIQUOR MAGNESII CARBONATIS.** *B.P.Syn.*—Fluid Magnesia.

Is prepared by impregnating Water with Carbonic Acid under pressure in which freshly precipitated Carbonate of Magnesium is suspended.

Each fluid ounce contains nearly 10 grs. of Carbonate of Magnesium.

**Tests.**—It is clear and free from any bitter taste. 1 fl. oz. evaporated to dryness gives a residue which after being calcined weighs about 4 grs. This residue is insoluble in Water, and answers to the tests for Magnesia.

The following volumetric test is suggested (*P.J.* xxiii. 620)—100 c. c. should require not less than 45·5 c. c. of the volumetric solution of Oxalic Acid, which is equal to ·914 MgO per cent., the equivalent of 4 grains of Oxide to the ounce. Litmus is used as the indicator.

**Dose.**—1 to 2 oz.

(Belg., Aqua Magnesiæ Aerata; Fr., Eau Magnésienne, not in the others.)

### Not Official.

**MISTURA ALBA.**—Carbonate of Magnesium, 10 grs.; Sulphate of Magnesium, 1 drm.; Peppermint Water, to 1 oz.—*King's College Hospital.*

**MISTURA MAGNESIÆ C. RHEO.**—Rhubarb, 7½ grs.; Carbonate of Magnesium, 15 grs.; Peppermint Water, 1 oz.—*St. Thomas's Hospital.*

**LIQUOR MAGNESII BROMIDI.**—Neutralise 20 oz. of Dilute Hydrobromic Acid (10 p. c.) with about 1 oz. of Carbonate of Magnesium: filter. Each teaspoonful contains nearly 7 grs. of Anhydrous Bromide of Magnesium.

**Dose.**—1 to 2 fluid drachms.

Has been used as a sedative in treatment of the insane.—*A.J.P.* '86, 531.

## MAGNESII CITRATIS LIQUOR.

SOLUTION OF CITRATE OF MAGNESIUM.

*N.O.Syn.*—Limonade Purgative.

Carbonate of Magnesium, 100 grs.; Citric Acid, 200 grs.; Syrup of Lemons, ½ oz.; Bicarbonate of Potassium, in crystals, 40 grs.; Water, a sufficiency.

Dissolve the Citric Acid in two ounces of the Water, and having added the Carbonate of Magnesium, stir until it is dissolved. Filter the solution into a strong half-pint bottle, add the Syrup and sufficient Water to nearly fill the bottle, then introduce the Bicarbonate of Potassium, and immediately close the bottle with a cork, which should be secured with string or wire; afterwards shake the bottle until the Bicarbonate of Potassium is dissolved.

(The U.S. formula modified. Austr., and Hung., Potio Magnesiæ Citricæ Effervescens; Belg., Limonada Citratis Magnesiæ; Fr., Limonade Purgative; Ital., Limonata Magnesiaca; Port., Limonada Citro-Magnesica; Russ., Potio Magnesii Citrici Ærophora; Span., Pocion de Citrato Magnesico Gaseosa; Swiss, Magnesium Citricum effervescens; not in the others.)

**Medicinal Properties.**—A pleasant aperient and refrigerant draught.

**Dose.**—5 to 10 oz.

## MAGNESII SULPHAS.

SULPHATE OF MAGNESIUM.

*B.P.Syn.*—Epsom Salt.

$MgSO_4 . 7H_2O$, eq. 246.

In minute, colourless, transparent, rhombic prisms, possessing a bitter taste.

**Solubility.**—10 in 13 of Water, measures 18; 20 in 3 of boiling Water.

**Tests.**—The aqueous solution gives copious white precipitates with Chloride of Barium (Sulphate), and with a mixed solution of Ammonia, Chloride of Ammonium and Phosphate of Sodium (Ammonio-Magnesian Phosphate); at ordinary temperatures it is not precipitated by Oxalate of Ammonium—indicating absence of Lime, nor does it give a brown precipitate with Chlorinated Lime or Soda—indicating absence of Iron. The precipitate given by Carbonate of Sodium, when obtained from a boiling solution of 100 grains of the salt, should, when well washed, dried, and heated to redness, weigh 16·26 grains.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—A mild and safe cathartic, operating with little pain or nausea. Used in colic and obstinate constipation, and in most cases where a cathartic is required which shall not cause debility or irritation of the stomach.

*Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.*

**Dose.**—1 to 4 drms.

Contained in Mistura Sennæ Comp. 1 in 5.

**Incompatibles.**—Carbonates of Potassium and Sodium (not the Bicarbonates), Lime Water, Acetate of Lead.

Sulphate of Magnesium should not be prescribed with Tartarated Soda, for after some time Tartrate of Magnesium will precipitate. The following prescription is an example:—

℞ Sodæ Tartaratæ, ʒj; Magnes. Sulph., ʒij; Aquæ ad ℥iss.

## Preparations.

### ENEMA MAGNESII SULPHATIS.

Sulphate of Magnesium, 1 oz.; Olive Oil, 1 oz.; Mucilage of Starch, 15 oz.: dissolve the Sulphate of Magnesium in the Mucilage, then add the Oil, and mix.

For one enema.

(Not in the other Pharmacopœias.)

### MAGNESII SULPHAS EFFERVESCENS. *B.P.Syn.*—EFFERVESCENT EPSOM SALT.

Sulphate of Magnesium in crystals, 100; Bicarbonate of Sodium, 72; Tartaric Acid, in powder, 38; Citric Acid, in powder, 25; Refined Sugar, in powder, 21. Dry the Sulphate of Magnesium at about 130° F. (54·4° C.) until it has lost nearly one-fourth (23 per cent.) of its weight; powder the product, mix it with the Sugar, and then with the other ingredients. Place the mixture in a dish or pan of suitable form, heated to between 200° and 220° F. (98·3° and 104·4° C.), and when the particles of the powder begin to aggregate, stir them assiduously until they assume a granular form; then by means of suitable sieves separate the granules of uniform and most convenient size, and preserve the preparation in well-closed bottles. =(1 in 2).

The product should weigh about 200.

**Dose.**—¼ to 1 oz.

## Not Official.

**MAGNESII SALICYLAS.**—Colourless hygroscopic needles. Readily soluble in Water and Rectified Spirit.

**Dose.**—50 to 100 grains daily have been given with advantage in typhoid fever. —*L.M.R.* '88, 62; *P.J.* xviii. 823; *T.G.* '88, 390.

**MAGNESII SULPHIS.**—A white crystalline powder, which gradually oxidises to Sulphate on exposure to the air.

**Solubility.**—1 in 20 of Water; insoluble in Rectified Spirit. Given in the place of Sulphite of Sodium.

Recommended in diphtheria as a **gargle**, 1 in 16 of Water, or by the application of the powder to the fauces by means of a damp brush, leaving as much of the powder on the throat as possible. The comparatively low solubility of the salt is an advantage in prolonging the action.—*L.* '87, i. 404.

**Dose.**—20 to 30 grains.

# MANGANESII OXIDUM NIGRUM.

BLACK OXIDE OF MANGANESE.

$MnO_2$, eq. 87.

Used for producing Chlorine and Permanganate of Potassium.

Its purity may be roughly estimated by heating it with a mixture of dilute Hydrochloric and Oxalic Acids. If quite free from impurity it will wholly dissolve to an almost colourless solution, and if the operation be performed quantitatively in a flask, fitted with a Chloride of Calcium drying tube, the weight of Carbonic Acid lost multiplied by 2 $(\frac{87}{44})$ will represent the $MnO_2$ in the quantity operated upon—$MnO_2 + 2HCl + 2C_2H_2O_4 = MnCl_2 + 2CO_2 + 2H_2O$.

If 1 grm. of the finely powdered Dioxide, contained in a small, long-necked flask, be mixed with 5 c. c. of Water, then 4·22 grm. of Ferrous Sulphate, in clear crystals, added, and subsequently 5 c. c. of Hydrochloric Acid, the mixture digested for about fifteen minutes at a gentle heat, and finally heated to boiling, the cooled filtrate, when immediately tested with freshly prepared Potassium Ferricyanide test solution, should not acquire a blue colour. (Presence of at least 66 p. c. of pure Dioxide of Manganese.)—*U.S.P.*

(Belg., Dan., Fr., Hung., Ital., Port., Russ., Span., Swiss and U.S.; not in the others.)

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Not Official.

## MANGANESII OXIDUM PRÆPARATUM.

Digest finely-powdered commercial Black Oxide in Diluted Hydrochloric Acid for twenty-four hours, frequently shaking the bottle containing them; then pour off the Acid; wash the Oxide thoroughly with Water, pouring off the lighter portions each time for use, and rejecting the heavier and coarser particles; finally dry in a water-bath.

An admirable remedy for gastrodynia, pyrosis, etc. Has been recommended as an emmenagogue.

**Dose.**—10 to 30 grs.

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Not Official.

## MANGANESII SULPHAS.

Colourless or pale rose-coloured, right rhombic prisms.

**Solubility.**—7 in 10 of Water; insoluble in Rectified Spirit.

(Dutch, Fr., Port., Russ., Span. and U.S.; not in the others.)

**Medicinal Properties.**—Purgative; it is, however, little used, being uncertain in its action, and apt to cause vomiting; its taste is disagreeably styptic.

**Dose.**—1 to 5 grs. as a tonic; 30 to 60 grs. as a purgative.

*Does not excite the liver, but is a powerful stimulant to the intestines.—Dr. Rutherford.*

**MANGANESII HYPOPHOSPHIS** ($MnP_2H_4O_4$).—A pale pink granular powder, soluble 1 in 7 of Water.

Used in the preparation of Syrupus Hypophosphitum Compositus B.P.C.

**MANGANESII PHOSPHAS** ($Mn_3P_2O_8.7H_2O$).—A whitish powder, prepared by precipitating a Manganous Salt with Phosphate of Sodium. When freshly precipitated, and dried without heat, it has the above formula, corresponding to 26 p. c. of Water, but commercial samples seldom lose on ignition more than 20 p. c.

Used to replace part of the Iron in Ferrous Syrups.

# MANNA.

MANNA.

A concrete saccharine exudation, obtained by transverse incision from the stems of *Fraxinus Ornus*.

It is cultivated for the purpose chiefly in Calabria and Sicily.

The larger and better kinds are called Flake Manna, and consist principally (60 to 80 per cent.) of Mannite, $C_6H_8(HO)_6$, eq. 182; together with common Sugar and extractive matter. Contains about 10 per cent. of moisture.

(Austr., Belg., Dan., Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Dutch.)

Pure Mannite is easily crystallised from an alcoholic solution, it cannot be fermented by Yeast.

It does not reduce Fehling's Solution, and gives no brown colour with boiling Potash.

**Solubility** of Mannite, 1 in 5 of Water: 1 in 150 of Rectified Spirit.

**Medicinal Properties.**—A mild laxative; does not excite inflammation; useful for children and delicate females.

**Dose.**—As a laxative, 60 grs. to 1 oz.

Not Official.

**MANNA DEPURATA.**—Dissolve Manna, 10, in sufficient Water; strain, and evaporate to 10. It is convenient for dispensing, and keeps good for a long time.

Not Official.

# MARANTA.

ARROW-ROOT.

The Starch obtained from the roots of *Maranta arundinacea*, a native of the tropical parts of America and the West Indies.

That which comes from Bermuda is considered the best.

A light white powder, or small pulverulent masses.

**Test.**—Free from unpleasant odour and taste.

(Austr., Belg., Dan., Fr., Norw., Port. (Araruta), Span. and Swed.; not in the others.)

**Medicinal Properties.**—Nutrient and demulcent, frequently taken with milk. It should be first made into a thin paste with cold milk, and boiling milk added to make a thick mucilage.

# MARMOR ALBUM.

WHITE MARBLE.

$CaCO_3$, eq. 100.

Used in producing Carbonic Acid Gas.

Owing to its freedom from Iron, it should also be used in the preparation of Lime for making Liquor Calcis Saccharatus.

(Fr. and Span.; not in the others.)

## MASTICHE.

### MASTICH.

A concrete resinous exudation obtained by incisions in the bark of the stem and large branches of *Pistacia lentiscus*.

Produced in the island of Scio.

Small irregular pale-yellow tears, brittle and either opaque or far more frequently transparent.

**Solubility.**—Insoluble in Water; partly soluble in Rectified Spirit and Oil of Turpentine; 2 in 1 of Ether; 2 in 1 of Chloroform.

**Sp. g.** 1·06—1·07.

(Austr., Belg., Dan., Norw., Swed. (Resina Mastix), Dutch, Fr., Hung., Port., Span. (Almaciga) and U.S.; not in Ger., Ital., Russ. or Swiss.)

**Medicinal Properties.**—Stimulant. Rarely used now except as a temporary stopping for teeth.

### Not Official.

**MASTIC DENTAIRE** (Fr.).—Mastic 2, Ether 1: dissolve.

Cotton saturated in this solution is a good stopping for decayed teeth.

**MASTIC AND CHLOROFORM.**—Mastic 2, Chloroform 1: dissolve. Used for the same purpose as above.

## MATICÆ FOLIA.

### MATICO LEAVES.

The dried leaves of *Piper angustifolium*.

Imported from Peru.

(Belg., Fr., Port., and U.S.; not in the others.)

**Medicinal Properties.**—An agreeable aromatic tonic and stimulant, influencing the urinary passages. The Volatile Oil is a powerful styptic.

**Dose.**—Of the powder, 30 to 120 grs. three times daily.

### Preparation.

**INFUSUM MATICÆ.**

Matico leaves, cut small, 1; boiling Distilled Water, 20: infuse half an hour, and strain.

**Dose.**—1 to 4 oz.

(Not in the other Pharmacopœias.)

### Not Official.

**EXTRACTUM MATICO FLUIDUM** (*U.S.*)—Prepared with a mixture of Alcohol (sp. g. ·820) 3, Water 1, so that 1 fl. oz. equals 1 oz. of Matico.

**TINCTURA MATICÆ.**—Matico leaves, in coarse powder, 1; Proof Spirit, 5: macerate fourteen days, strain, express, and filter. = (1 in 5).

Astringent. Useful in catarrh of the bladder of the aged.

**Dose.**—1 to 2 drms.

(Fr., 1 and 5; U.S., 1 in 10; not in the others.)

# MEL.

## HONEY.

A saccharine secretion deposited in the honeycomb by *Apis mellifica*, the Hive Bee.

**Tests.**—Boiled with Water for five minutes, and allowed to cool, it does not become blue with the Solution of Iodine—indicating absence of Flour. After incineration it should not yield more than ·2 per cent. of ash, the solution of which in Water acidulated with Nitric Acid should not give more than a slight turbidity with solution of Chloride of Barium (trace of Sulphate).

(In all the Pharmacopœias.)

**Medicinal Properties.**—Demulcent and laxative, but apt to gripe and occasion flatulency when given in efficient doses; this is more particularly the case with old honey. It is more generally used as a vehicle for other medicines. A useful addition to gargles.

### Preparations.

**MEL DEPURATUM.** Clarified Honey.

Melt Honey in a water-bath, and strain while hot through flannel previously moistened with warm Water.

(Port., Mellito Simples; Span., Miel Depurado; in all the Pharmacopœias except Fr.)

Used in the preparation of Confectiones Piperis, Scammonii, and Terebinthinæ; Mel Boracis, Oxymel and Oxymel Scillæ.

**OXYMEL.**

Clarified Honey, 8; Acetic Acid, 1; Distilled Water, 1: liquefy the Honey by heat, and mix with it the other two.

A pleasant addition to Gargles. Sometimes used as a vehicle for expectorant medicines.

**Dose.**—1 to 2 drms.

(Austr., Honey 2, Common Vinegar 1; Fr., Honey 4, White Vinegar 1; Dutch, Honey 19, Acetic Acid (30 p. c.) 1; Hung., Honey 50, Acetic Acid (96 p. c.) 1; Port., Honey 197, Acetic Acid (98 p. c.) 3; Russ., Honey 49, Acetic Acid (95 p. c.) 1; Span., Honey 23, Vinegar 8; Swed., Honey 100, Acetic Acid (29 p. c.) 8; not in the others.)

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# MENTHÆ PIPERITÆ OLEUM.

## OIL OF PEPPERMINT.

The Oil distilled in Britain from fresh flowering Peppermint, *Mentha piperita.* Colourless, pale yellow, or greenish-yellow when recent, but becoming gradually thicker and reddish by age.

The variations in quality of the English Oils depend, (1) upon whether they have been obtained from "Black Mint" (the ordinary plant), or from "White Mint"; (2) upon the subsequent rectification. So that from the finest double-rectified White Mint to the first crude distillate from the Black Mint, there are all manner of gradations, each of them "Ol. Menth. Pip. Ang."

The principal constituent of this Oil is Menthol. It also contains a small proportion of lower boiling constituents, regarding the composition of which there exists a difference of opinion; some regard them as unoxygenated terpenes, others as allied to Menthol in the same relation as Laurel Camphor to Borneol and capable of conversion into it by addition of Hydrogen.

Dementholised Oil of Peppermint is commonly known as "Menthene" and is used for purposes of adulteration.

A pure Peppermint Oil cooled in a mixture of Ice and Salt should on the addition of one or two Menthol Crystals set to a more or less solid crystalline mass.

**American Oil of Peppermint** is also the product of *Mentha piperita* but contains less Menthol.

**Japanese Oil of Peppermint** is from *Mentha Arvensis v. piperascens* and is rich in Menthol.

**Sp. g.** of all varieties seem to vary between ·890 (more usually ·900) and ·920.

**Polarising Rotation** (200 m. m.) from —50° to —70°.

The Oil of Mentha Piperita is as a rule distinguished from that of Mentha Arvensis by developing a blue colour and red fluor when mixed with 4 vols. of Glacial Acetic Acid. This colour is not developed if air be excluded, and, depending as it does upon some minor constituent destroyed by prolonged exposure to sunlight, it may not be given by some old samples.

In America the oil is distilled from the *dried* rather than the *fresh* herb, the yield being practically the same, and it is much more convenient for the distiller. About 350 lbs. fresh plant yield 1 lb. of Oil, and the plant loses about 50 p.c. of its weight in drying.—*Jour. Chem. Ind.* '88, 550.

**Solubility.**—In all proportions of Absolute Alcohol; 2 in 1 (*or less*) of Rectified Spirit, becomes milky on adding more Spirit.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Essenza di Menta), Norw., Port. (Essencia de Hortela Pimenta), Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—A grateful aromatic, stimulant, and carminative. Allays nausea, relieves spasmodic pains in the stomach. Useful in the flatulent colic of children. Covers the taste of nauseous medicines, such as Rhubarb, and mitigates the griping effect of purgatives. Externally applied, relieves facial neuralgia; *see* also Menthol.

Recommended as an antiseptic.—*L.* '88, i. 512.

**Dose.**—1 to 4 minims of the Oil on **sugar,** or in **pill.** *See* p. 405.

## Preparations.

### AQUA MENTHÆ PIPERITÆ.

Oil of Peppermint, 1½ drms.; Water, 1½ galls.: distil 1 gall. =(Oil 1 in 853).

**Dose.**—1 to 2 oz.

(Belg., ·3 in 1000; Dan. and Russ., 1 in 2000; Dutch, 1 in 1000; U.S., 1 in 500; Austr., Fr., Ger., Hung., Ital., Port., Span., Swed. and Swiss, distilled from the **leaves**; not in Norw.)

### ESSENTIA MENTHÆ PIPERITÆ.

Oil of Peppermint, 1; Rectified Spirit, 4: mix. =(1 in 5).

**Dose.**—10 to 20 minims.

### SPIRITUS MENTHÆ PIPERITÆ.

Oil of Peppermint, 1; Rectified Spirit, 49: dissolve. =(1 in 50).

(Belg. (Spiritus Menthæ) Oil 1, Spirit 99; Fr. (Teinture d'Essence de Menthe), Oil 2, Alcohol 98; Ger., 1 in 10; Swiss, 3 Oil in 100; U.S., from the leaves and oil, about 1 in 10; Austr. and Span., from leaves; not in the others.)

**Dose.**—30 to 60 minims, or for children under 5 years, 1 to 3 minims.

An agreeable **Peppermint Syrup** is made by adding 60 minims of the Spirit to 1 oz. of Simple Syrup.

## MENTHÆ VIRIDIS OLEUM.

### OIL OF SPEARMINT.

*N.O.Syn.*—MENTHÆ CRISPÆ OLEUM.

The Oil distilled in Britain from fresh flowering Spearmint, *Mentha viridis.*

**Solubility.**—In all proportions of Absolute Alcohol; 1 in 1 (*or less*) of Rectified Spirit, becomes milky on adding more Spirit.

(Belg., Hung., Norw., Port. (Essencia de Hortela), Russ., Span. and U.S. (sp. g. ·930—·940); not in the others.)

**Medicinal Properties.**—Similar to those of Oleum Menthæ Piperitæ.

**Dose.**—1 to 4 minims on **sugar,** or made into **pills** with Liquorice powder and Soap, *see* p. 405.

### Preparation.

### AQUA MENTHÆ VIRIDIS.

Oil of Spearmint, 1½ drms.; Water, 1½ galls.: distil 1 gall. =(Oil 1 in 853).

**Dose.**—1 to 2 oz.

(Belg., ·3 in 1000; Russ., 1 in 3000; U.S., 1 in 500; Port. (Agua de Hortela); Span. and Swed., from **leaves**; not in the others.)

## MENTHOL.

$C_{10}H_{20}O$, eq. 156.

A Stearoptene obtained by cooling the Oil distilled from the fresh herb of *Mentha Arvensis vars. piperascens et glabrata,* and of *Mentha piperita.*

Colourless acicular crystals, usually more or less moist from adhering Oil, or fused crystalline masses. Its melting point should not exceed 110° F. (43·3° C.). The hardest masses do not melt below 108° F. (42·2° C.). It should be entirely dissipated by the heat of a water-bath.

**Solubility.**—Almost insoluble in Water and Glycerine; soluble 5 in 1 of Rectified Spirit; 4 in 1 (nearly) of Chloroform; 8 in 3 of Ether; 10 in 7 of Benzin; 1 in 4 of Olive Oil.

(Austr., Dan., Ger., Ital. (Mentolo), Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Useful locally in some forms of neuralgia and headache, also in rheumatism. It possesses antiseptic properties.

**B.P.Dose.**—½ to 2 grs.

Largely used in the form of **cones** and **pencils.**

An ethereal or alcoholic **solution** (20 to 30 p. c.) forms a useful local anæsthetic for the mucous membrane, but its effects are transient.—*L.* '85, ii. 128; *B.M.J.* '87, i. 800.

**Spray** containing 5 to 20 p. c. of Menthol recommended in tubercular laryngitis. —*T.G.* '87, 762.

Menthol and Iodoform equal parts as a **surgical dressing.**—*B.M.J.* '88, i. 933.

### Preparation.

### EMPLASTRUM MENTHOL.

Menthol, 2; Yellow Wax, 1; Resin, 7; melt the Wax and Resin together, and as the mixture cools, stir in the Menthol until dissolved.

The plaster melts at such a low temperature (60°—70° C.) that it may be spread without loss of Menthol by evaporation.

### Not Official.

**MENTHOLEATE.**—A name given to a solution of Menthol in Oleic Acid. Menthol 200 grs., Oleic Acid ½ oz.; heat gently in a test-tube till dissolved. It is recommended as the best form for application.—*T.G.* '87, 36.

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### Not Official.

## MENYANTHES.

BUCKBEAN.

The leaves of *Menyanthes trifoliata*, a gentianaceous plant.

(Austr., Dutch, Ger., Hung., and Swiss, Trifolium Fibrinum; Dan., Fr., Norw., Russ., and Swed., Menyanthes; Ital., Trifoglio Fibrino; Port., Trifolio Fibrino; Span., Trebol Acuatico. Not in Belg. or U.S.)

**Medicinal Properties.**—A bitter tonic and cathartic.

Recommended in functional amenorrhœa.—*L.* '85, i. 132, 235.

### Preparation.

**EXTRACTUM MENYANTHIS.**—Buckbean exhausted with boiling Water, and the liquor evaporated to an Extract.

(Austr., Dan., Dutch, Ger., Ital., Port., Russ., Swed. and Swiss; not in the others.)

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### Not Official.

## METHYL CHLORIDUM.

$CH_3Cl$.

Chloride of Methyl is a colourless gas of an ethereal odour and a sweet taste, soluble in Water to the extent of 2·8 volumes. When beet-root molasses are fermented and distilled for their alcohol, the residues yield on destructive distillation compounds of Trimethylamine. When Trimethylamine Hydrochloride is heated to 260° C. it decomposes into Trimethylamine, Ammonia, and Methyl Chloride. The mixed gases are passed through acid to absorb the alkaline vapours, and the Methyl Chloride which passes over is washed and liquefied by cold and pressure.

This liquid is prepared in Paris, and supplied in metal cylinders, some of which are fitted with a valve and a tube for producing a jet; also with a nozzle for running the liquid into a specially designed glass tube for use with tampons.

**Medicinal Properties.**—It is used as a local anæsthetic, producing intense cold by its evaporation. If used incautiously, it may produce blisters or eschars.—*B.M.J.* '85, i. 813; '88, ii. 243; *L.* '89, i. 190.

Not Official.

## METHYLAL.

$C_3H_8O_2$.

A colourless volatile liquid (sp. g. ·855). Boils at 107° F. Readily soluble in Water and Rectified Spirit.

**Medicinal Properties.**—Hypnotic. Given in delirium and mania.

Toleration of the drug is soon established, when the dose must either be increased or discontinued for two or three days.—*B.M.J.* '87, ii. 894; '88, i. 481; '88, ii. 1454; *L.* '90, i. 718.

**Dose.**—30 to 120 minims in water.

Not Official.

## METHYLENE BLUE.

TETRAMETHYLTHIONINE CHLORIDE.

For medicinal purposes it is prepared chemically pure and free from Zinc.

An analgesic, dose 1 to 5 grains.—*T.G.* '90, 529; *L.* '91, i. 99.

In malaria, dose 1½ grains five times a day.—*T.G.* '91, 859; '92, 471; *L.* '92, i. 817; '93, i. 545; *B.M.J.E.* '93, ii. 107.

Has been recommended in gonorrhœa, dose ½ to 1½ grains twice or three times a day.

Under the fancy name **Pyoctanin** (blue), Methyl-Violet (another coal-tar colour), has been recommended in the treatment of malignant tumours.

# MEZEREI CORTEX.

MEZEREON BARK.

The dried bark of *Daphne Mezereum,* Mezereon; or *Daphne Laureola,* Spurge Laurel.

(Belg., Dutch, Fr. (Mézéréon ou Bois gentil), Ital. (Mezereo), Port. (Trovisco), Span. (Mecereon), Swed., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—A stimulant and vesicant. An ointment of the bark is used to keep issues or blisters open. Rarely given alone internally, but it is still retained as an ingredient in Decoctum Sarsæ Compositum. It formerly was used in the treatment of syphilis.

### Preparation.

**EXTRACTUM MEZEREI ÆTHEREUM.**

Mezereon Bark, cut small, 4; Rectified Spirit, 40; Ether, 5: macerate the Mezereon in three-quarters of the Spirit for three days with frequent agitation, strain and press. To the residue of the Mezereon, add the remainder of the Spirit, and again macerate for three days, with frequent agitation, strain and press, mix and filter the strained liquors; recover the greater part of the Spirit by distillation, evaporate what remains to the consistence of a soft extract, put this into a stoppered bottle with the Ether, and macerate for twenty-four hours, shaking them frequently, decant the ethereal solution, recover part of the Ether by distillation, and evaporate what remains to the consistence of a soft extract.

Used in preparing Linimentum Sinapis Compositum; 8 grains are contained in 1 oz. (Belg. (Ext. Mezerei), Ital. (Estratto di Mezereo Eteres), Fr. (Extrait de Garou, from the *Daphne Gnidium*), and Port. (Extracto de Trovisco) with Spirit only; Swiss and U.S., **Fluid Extract** with Alcohol 1 in 1; not in the others.)

**Not Official.**

**UNGUENTUM MEZEREI.**

Belg.—Ext. Mezerei, 39; Lard, 865; Yellow Wax, 96; Alcohol (92°), 90.
Dutch.—Ext. Mezerei, 1; Simple Ointment, 10.
Fr.—Ext. Garou, 4; Lard, 90; White Wax, 10; Alcohol, 9.
Ital.—Extract, 1; Alcohol, 1; Benzoated Lard, 27; Wax, 3.
Swiss.—Fluid Extract, 4; Alcohol, 10; White Wax, 10; Lard, 86.

## MICA PANIS.

SOFT CRUMB OF BREAD.

Used in the preparation of Cataplasma Carbonis.

**Not Official.**

**CATAPLASMA MICÆ PANIS.**—Grated Crumb of Bread and boiling water *q.s.*

## MISTURÆ.

MIXTURES.

The following are the mixtures of the British Pharmacopœia:—

| Dose. | | Proportions. |
|---|---|---|
| ½ to 1 oz. | MISTURA AMMONIACI | about 13 grs. in 1 oz. |
| 1 to 2 oz. | MISTURA AMYGDALÆ | compound powder 1 to 8. |
| 1 to 2 oz. | MISTURA CREASOTI | about 1 minim in 1 oz. |
| 1 to 2 oz. | MISTURA CRETÆ | about 13 grs. in 1 oz. |
| 1 to 2 oz. | MISTURA FERRI AROMATICA. | |
| 1 to 2 oz. | MISTURA FERRI COMPOSITA | 2½ grs. in 1 oz. |
| ½ to 2 oz. | MISTURA GUAIACI | about 11 grs. in 1 oz. |
| ½ to 2 oz. | MISTURA OLEI RICINI | 3 fl. drms. in 1 oz. |
| 1 to 3 oz. | MISTURA SCAMMONII | 3 grs. in 1 oz. |
| 1 to 1½ oz. | MISTURA SENNÆ COMPOSITA | 1 oz. Magn. Sulph. in 5 oz. |
| 1 to 2 oz. | MISTURA SPIRITUS VINI GALLICI | about 1 Brandy in 2½. |

## MORI SUCCUS.

MULBERRY JUICE.

The deep purple juice of the ripe fruit of *Morus nigra*.
Sp. g. about 1·060.

(Fr., Suc de Mûre; Port., Amoras; Span., Zumo de Moras.)

**Medicinal Properties.**—Refreshing and laxative; serves to prepare a grateful drink well adapted to febrile cases.

### Preparation.

**SYRUPUS MORI.**

Mulberry Juice, 20; Refined Sugar, 36; Rectified Spirit, 2½: heat the Juice to the boiling-point, and when it has cooled filter it; dissolve the Sugar in the filtered liquid by a gentle heat, and add the Spirit; the product should weigh 54. Sp. g. 1·330.

**Dose.**—1 drm.

(Austr., Belg., Fr. (Sirop de Mûres), Hung., Ital., Span. and Swiss; not in the others.)

An agreeable addition to a gargle for sore throat. Used as a colouring matter for draughts, 1 drm. to 1 oz.

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Not Official.

## MORPHINA.

$C_{17}H_{19}NO_3.\ H_2O$, eq. 303.

When dried at 212° F. (100° C.) as directed in all Official estimations the $H_2O$ is driven off, the equivalent is then 285.

The principal alkaloid obtained from Opium.

A white crystalline powder, bitter in taste, alkaline in reaction.

It forms crystallisable salts with Acids.

**Tests.**—When dissolved in Sulphuric Acid, and a few drops of Water added to make the mixture hot, the addition of a drop of Nitric Acid produces a red colour. Perchloride of Iron gives a blue colour, which, however, is not permanent, and which is interfered with by excess of acid, heat, or alcohol.

**Solubility.**—1 in 1000 of Cold Water; 1 in 100 of Rectified Spirit; 1 in 10 of Oleic Acid; 1 in 125 of Glycerine; but the solubilities depend very largely on the physical condition of the alkaloid. Insoluble in Ether (so differing from Narcotin); aqueous Alkalies, even Lime Water, dissolve it readily; Ammonia, however, but sparingly; where a very strong solution is required Hypophosphorous Acid has been suggested as a solvent.

(Belg., Fr., Hung., Ital., Port., Span., Swed. and U.S.; not in the others.)

**Medicinal Properties.**—Similar to the salts of Morphine, but owing to its slight solubility in Water it is rarely given alone.

**Dose.**—$\frac{1}{10}$ to ½ gr.

### Preparation.

**MORPHINÆ OLEAS.**—Morphine, 1 gr., dissolved in Oleic Acid, 60 grs.

Used locally for the relief of pain, also in combination with Oleate of Mercury.

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## MORPHINÆ ACETAS.

ACETATE OF MORPHINE.

$C_{17}H_{19}NO_3.\ HC_2H_3O_2.\ 3H_2O$, eq. 399.

A white powder, prepared by dissolving freshly precipitated hydrate in excess of Acetic Acid, and evaporating to dryness.

As it is practically impossible to dry the salt without a slight loss of Acetic Acid, the commercial Acetate generally requires a little added Acetic Acid to make a clear solution.

Aqueous solutions have a strong tendency to deposit basic salts, and to become acid.

**Solubility.**—Theoretically 1 in $2\frac{1}{2}$ of Water, but most samples will require the addition of Acid; 1 in 100 of Rectified Spirit; 1 in 5 of Glycerine.

**Tests.**—20 grains of the salt forms with 1 drachm of Water a slightly turbid solution, which is rendered clear by the addition of 1 grain of Acetic Acid; and this solution, when mixed with Ammonia in slight excess, yields a precipitate which, after washing with a little cold water and drying in a water-bath, weighs 15 grains.

This figure does not take into account the loss of water of hydration in drying.

If the salt yields a larger proportion than this, it should be recrystallised from hot Water acidulated with Acetic Acid. When Sulphuric Acid is added to the salt, acetous vapours are evolved. Its aqueous solution yields a white precipitate with Solution of Potash, soluble in excess. Ignited with free access of air it leaves no residue.

(Belg., Norw., Port., Span., Swed. and U.S.; not in the others.)

**Medicinal Properties.**—Similar to those of Opium. This salt being much more soluble in Water than the Hydrochlorate is used for **hypodermic injection.** But by keeping, it loses some Acetic Acid and becomes partly insoluble.

Recommended in the treatment of diabetes.—*Pr.* xxxviii. 20; *B.M.J.* '89, i. 118.

**Dose.**—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

**Incompatibles.**—Alkalies and alkaline earths, astringent vegetable infusions and decoctions.

**Antidotes.**—*See* Hydrochlorate of Morphia.

## Preparations.

### INJECTIO MORPHINÆ HYPODERMICA.

A solution of Acetate of Morphine containing one grain of the Acetate in ten minims of the injection.

Hydrochlorate of Morphine, 92 grs.; Solution of Ammonia, Acetic Acid and Distilled Water, of each a sufficiency.

Dissolve the Hydrochlorate of Morphine in two ounces of Distilled Water, aiding the solution by a gentle heat; then add Solution of Ammonia so as to precipitate the Morphine, and render the liquid slightly alkaline; allow it to cool; collect the precipitate on a filter, wash it with Distilled Water, and allow it to drain; then transfer the Morphine to a small porcelain dish with about an ounce of Distilled Water, apply a gentle heat, and carefully add Acetic Acid until the Morphine is dissolved, and a very slightly acid solution is formed. Add now sufficient Distilled Water to make the solution measure exactly two fluid ounces. Filter and preserve the product in a stoppered bottle excluded from the light.

When a comparatively fresh Acetate of Morphine is available, this solution is more readily made by suspending 96 grains of the salt in an ounce of Water, and dissolving it with the smallest possible excess of Acetic Acid (usually between 20 and 40 minims of Diluted Acetic Acid), making up to 2 oz. and filtering.

It will have a sp. g. 1·027.

**Tests.**—It should be a clear solution free from any solid particles, very slightly acid to test-paper. A fluid drachm of it, rendered slightly alkaline by the addition of Solution of Ammonia, yields a precipitate of Morphine which, after being washed and dried, should weigh 4·25 grains, corresponding to 6 grains of Acetate of Morphine.

NOTE.—This solution is practically the same strength as before; 1 fluid drachm now yields 4·25 grains, and formerly it yielded 4·3 grains. The solution is now stated to contain 1 grain of Acetate of Morphine in 10 minims, and formerly 1 grain in 12 minims, but this apparent difference is chiefly owing to the alteration in the chemical formula from the anhydrous to the hydrated salt.

**Dose.**—By subcutaneous injection, commencing with from 1 to 2 minims.

### LIQUOR MORPHINÆ ACETATIS.

Acetate of Morphine, 9 grs.; Diluted Acetic Acid, 18 minims; Rectified Spirit, ½ oz.; Distilled Water, 1½ oz.: dissolve the Acetate in the mixed liquids. =(1 in 100).

1 grain is contained in 107 minims.

The Acetate of Morphine should be recently prepared and of such quality that 20 grains should form a clear solution with 1 drachm of Water by the help of not more than 1 grain of Acetic Acid.

Solution of Acetate of Morphine may also be prepared by diluting 90 minims of Injectio Morphinæ Hypodermica with a sufficiency of a mixture of 1 volume of Rectified Spirit and 2 volumes of Water to form 2 ounces of the solution.

**Dose.**—10 to 60 minims.

### Not Official.

**LIQUOR MORPHINÆ ACETATIS HYPODERMICUS** (1 in 6).—1 grain of the Acetate of Morphine in every 6 minims of the solution, which should be nearly neutral. This solution has been in use for many years.

**Dose.**—1 to 3 minims for each injection.

**LIQUOR MORPHINÆ ET ATROPINÆ HYPODERMICUS.**—Acetate of Morphine, 10 grs.; Sulphate of Atropine, ¼ gr.; Water, 60 minims: dissolve.

½ grain of Acetate of Morphine and $\frac{1}{80}$ grain of Sulphate of Atropine in every 3 mins.

**Dose.**—1 to 3 minims for each injection.

Atropine combined with Morphine increases its calming effect, whilst it lessens its constipating effect.

## MORPHINÆ BIMECONATIS LIQUOR.

SOLUTION OF BIMECONATE OF MORPHINE.

The preparation originally known by this name is described p. 365.

The British Pharmacopœia gives the following formula:—

Dissolve Hydrochlorate of Morphine 9 grains in 2 or 3 drachms of Distilled Water, aiding solution by warmth; then add Solution of Ammonia until Morphine ceases to be precipitated, cool, filter; wash the precipitate with Distilled Water until the washings cease to give a precipitate with Nitrate of Silver; drain; mix the precipitate with sufficient water to produce 1½ oz.; add Rectified Spirit ½ oz. and Meconic Acid 6 grains: dissolve.

A colourless or nearly colourless liquid, of which 1 fl. oz. contains about 5½ grains of Bimeconate of Morphine.

**Dose.**—5 to 40 minims.

Not Official.

## LIQUOR MORPHIÆ BIMECONATIS (SQUIRE).

This preparation was introduced by the Author in 1839 as a purified Solution of Opium containing the whole of the alkaloids in their natural state of combination, and is now standardised to contain 1 per cent. of Morphine.

It differs from Tincture of Opium in that the volatile and extractive matters, to which the unpleasant secondary effects of Opium have been attributed, are removed in the process of its manufacture.

The Solution of the same name inserted in the B.P. of 1885, though obviously intended to take its place, differs so widely from the original in its properties and method of preparation, that it is no substitute for it.

See p. 384.

## MORPHINÆ HYDROCHLORAS.

HYDROCHLORATE OF MORPHINE.

*B.P.Syn.*—Morphiæ Murias.

$C_{17}H_{19}NO_3.\ HCl.\ 3H_2O$, eq. 375·5.

A white powder, or in thin prisms of a silky lustre.

**Solubility.**—1 in 24 of Water; about 1 in 50 of Rectified Spirit; 1 in 8 of Glycerine; insoluble in Ether.

**Tests.**—Its aqueous solution gives a white curdy precipitate with Nitrate of Silver (Chloride), and a white one with Potash (Morphine), which is redissolved when an excess of the alkali is added. Moistened with strong Nitric Acid it becomes orange-red, and with solution of Perchloride of Iron greenish-blue. Warmed with strong Sulphuric Acid and a little Arseniate of Sodium, a bluish-green tint results. Ignited with free access of air, it burns without leaving any residue. 20 grains of the salt, dissolved in half-an-ounce of warm Water, with Ammonia added in the slightest possible excess, give, on cooling, a crystalline precipitate, which, when washed with a little cold Water and dried in a water-bath, weighs 16 grains.

The following are reckoned on the B.P. standard of Opium containing 10 p. c. of Morphine:—

1 gr. Hydrochl. Morph. = $9\frac{1}{3}$ grs. Opium = 8 grs. Powd. Opium = $4\frac{2}{3}$ grs. Ext. Opium = 117 minims Tinct. Opium.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.)

**Medicinal Properties.**—Hydrochlorate of Morphine possesses the anodyne and soporific powers of Opium, yet it acts more agreeably, being less likely to produce headache and nausea. It is also less exciting and stimulating than Opium.

In uræmia.—*L.* '89, ii. 208, 263.

*Has no appreciable effect on the secretion of bile, and does not prevent the stimulating effect of such a substance as the Salicylate of Soda.—Dr. Rutherford.*

**Dose.**—$\frac{1}{8}$ to $\frac{1}{2}$ gr.

**Incompatibles.**—Alkalies and alkaline earths, astringent vegetable infusions and decoctions.

**Antidotes.**—If taken by the mouth, induce vomiting, and wash out the stomach. Keep the patient walking about, and rouse him in every way. Ammonia or Spirit of Sal Volatile to the nose, inject a pint of strong Coffee into the bowel. Hypodermic injection of Sulphate of Atropia $\frac{1}{20}$ gr., repeating in quarter hour if necessary. Tincture of Belladonna, Nitrite of Amyl inhalation, artificial respiration.—*Murrell on Poisons.* $\frac{1}{32}$ gr. Strychnine acts as an antidote to $\frac{1}{2}$ gr. of Morphine.—*L.* '71, ii. 849, 907; Picrotoxine, $\frac{1}{20}$ gr., *L.* '89, i. 497.

## Preparations.

### LIQUOR MORPHINÆ HYDROCHLORATIS.

Hydrochlorate of Morphine, 9 grs.; Diluted Hydrochloric Acid, 18 minims; Rectified Spirit, $\frac{1}{2}$ oz.; Distilled Water, $1\frac{1}{2}$ oz.: dissolve. =(about 1 in 100).

Now contains about 1 grain in 109 minims, formerly 1 in 123 minims.

**Dose.**—10 to 60 minims.

(Port. (Soluto de Chlorhydrato de Morphina), 1 in 20, for hypodermic injection; not in the other Pharmacopœias.)

A Solution for Hypodermic injection cannot be made (cold) stronger than 1 in 20. If a stronger solution be used, it must be injected whilst warm; the solution of the Acetate therefore is more convenient.

### SUPPOSITORIA MORPHINÆ.

Hydrochlorate of Morphine, 6 grs.; Oil of Theobroma, 174 grs.: rub the Hydrochlorate of Morphine with 24 grs. of the Oil of Theobroma in a slightly warmed mortar, and add this to the remainder of the Oil of Theobroma previously melted at a low temperature: mix the whole thoroughly, and pour the mixture while it is fluid into suitable moulds of the capacity of 15 grs.

Each suppository contains $\frac{1}{2}$ grain of Hydrochlorate of Morphine.

(Not in the other Pharmacopœias.)

### SUPPOSITORIA MORPHINÆ CUM SAPONE.

Hydrochlorate of Morphine, 6 grs.; Glycerine of Starch, 30 grs.; Curd Soap, in powder, 100 grs.; Starch, in powder, a sufficiency.

Mix the Hydrochlorate of Morphine with the Glycerine of Starch and Soap, and add sufficient Starch to form a paste of suitable consistence. Divide the mass into twelve equal parts, each of which is to be made into a conical or other convenient form for a suppository.

Each suppository contains $\frac{1}{2}$ grain of Hydrochlorate of Morphine.

### TINCTURA CHLOROFORMI ET MORPHINÆ.

The formula is given under Chloroform.

### TROCHISCI MORPHINÆ.

Lozenges made with Hydrochlorate of Morphine, Tincture of Tolu, Sugar, and Gum Acacia.

Each lozenge contains $\frac{1}{36}$ gr. of Hydrochlorate of Morphine.

**Dose.**—1 to 6 lozenges. One or two occasionally for cough.

### TROCHISCI MORPHINÆ ET IPECACUANHÆ.

Lozenges prepared with Hydrochlorate of Morphine, Ipecacuanha, Tincture of Tolu, Sugar, and Gum Acacia.

Each lozenge contains $\frac{1}{36}$ gr. of Hydrochlorate of Morphine, and $\frac{1}{12}$ gr. of Ipecacuanha.

**Dose.**—1 to 6 lozenges. One or two occasionally for cough.

(U.S. contains $\frac{1}{40}$ gr. of Sulphate of Morphine, and $\frac{2}{25}$ gr. of Ipecacuanha in each; Swiss (Pastilli Ipecacuanhæ cum Opio), contains about $\frac{1}{32}$ gr. of each, Ipecac. and Opium.)

Not Official.

## MORPHINÆ LACTAS.

$C_{17}H_{19}NO_3.C_3H_6O_3$, eq. 375.

A white crystalline salt.

**Solubility.**—1 in 8 of Water, 1 in 93 of Rectified Spirit.

**Dose.**—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

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## MORPHINÆ SULPHAS.

### SULPHATE OF MORPHINE.

$(C_{17}H_{19}NO_3)_2$, $H_2SO_4$, $5H_2O$, eq. 758.

Colourless acicular crystals.

**Solubility.**—1 in 21 of Water, freely in hot Water; sparingly in Rectified Spirit.

**Tests.**—Its aqueous solution gives a white precipitate (Morphine) with Solution of Potash, soluble in excess; and with Chloride of Barium a white precipitate (Sulphate), insoluble in hot Hydrochloric Acid.

(Belg., Dutch, Fr., Norw., Port., Russ., Span., Swiss and U.S.; not in the others.)

**Dose.**—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

Preparation.

**LIQUOR MORPHINÆ SULPHATIS.**

Sulphate of Morphine, 35 grs.; Rectified Spirit, 2 oz.; Distilled Water to produce 8 oz.: dissolve the Sulphate of Morphine in part of the Water, add the Rectified Spirit, and finally the remainder of the Water. =(1 in 100.)

**Dose.**—10 to 60 minims.

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Not Official.

## MORPHINÆ TARTRAS.

$C_{17}H_{19}NO_3.C_4H_6O_6.3H_2O$, eq. 489.

A white powder.

**Solubility.**—1 in 10 of Water; sparingly in Rectified Spirit.

**Dose.**—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

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## MORRHUÆ OLEUM.

### COD-LIVER OIL.

*N.O.Syn.*—OLEUM JECORIS ASELLI.

The Oil extracted from the fresh liver of the Cod, *Gadus morrhua*, by the application of a heat not exceeding 180° F. (82·2° C.). Pale yellow, with a slight fishy odour, and bland fishy taste.

Sp. g. varies between ·920 and ·930.

**Solubility.**—Sparingly in Absolute Alcohol; 1 in 2 of Ether; 1 in $3\frac{1}{2}$ to 4 of Acetic Ether.

**Test.**—A drop of Sulphuric Acid added to a few drops of the Oil on a porcelain slab develops a violet colour, which soon passes to a yellowish or brownish red.

Probably the most important character is the acidity, varying from 0·0 in a very fine colourless Oil to 9 p. c. in dark coloured samples altered by heat and long keeping. Upon the acidity also depends the presence or absence of Albumens; fine Oils with little acid show an Albumen ring on being floated upon Nitric Acid, sp. g. 1·400.

A solvent of pure Quinine. 1 oz. at 140° F. will dissolve 4 grains readily.

(Austr., Belg., Dan., Dutch, Ger., Hung., Norw., Russ., Swed. and Swiss, Ol. Jecoris Aselli; Fr., Huile de Foie de Morue; Ital., Olio di Fegato di Merluzzo; Port., Oleo de Bacalhau; Span., Aceite de Higado de Bacalao; U.S., Oleum Morrhuæ.)

**Medicinal Properties.**—Nutrient and demulcent. Most efficient in scrofulous diseases, glandular swellings, diseases of the joints, tabes mesenterica, rickets, and chronic rheumatism: and generally in all chronic cases of impaired digestion, assimilation, and nutrition. In pulmonary consumption it deservedly possesses a high reputation: sometimes given in emulsion with Malt Extract.

**Dose.**—Brit. Ph. dose, 1 to 8 drms. 1 to 4 drms., on Orange Juice, Water, or a mixture of Tincture of Orange with Diluted Nitric Acid and Syrup.

The Oil is sometimes given in **flexible capsules.**

Cod-Liver Oil has engaged much attention amongst Pharmaceutists. The Year-books of Pharmacy are full of suggestions how to render it palatable; one author finishes up with a triumph, that the particles of Oil struggle in vain for re-union.

The following formula makes a good Emulsion:—

| | |
|---|---|
| Powder of Tragacanth | 15 grs. |
| Powder of Gum Acacia | 15 grs. |
| Rubbed into a paste by first adding | |
| Syrup | ¼ oz. |
| And then Water | 1½ oz. |
| Rub these into a good mucilage, and add by a thin stream | |
| Cod-Liver Oil | 2½ oz. |
| Essence of Lemon | 12 minims. |
| Essential Oil of Almonds | 1 minim. |
| These being well incorporated, add gradually | |
| Distilled Water | 2½ oz. |
| And lastly add cautiously | |
| Rectified Spirit | ¾ oz. |

The excellency of the Emulsion is in proportion to the diligence of the operator in using his pestle and mortar.

**EMULSIO OLEI MORRHUÆ** (*B.P.C.*). — Cod-Liver Oil, 8 oz.; the yolks of 2 Eggs; Tragacanth in powder, 16 grs.; Elixir of Saccharin, 60 mins.; Simple Tincture of Benzoin, 60 mins.; Spirit of Chloroform, ½ oz.; Essential Oil of Bitter Almonds, 8 mins.; Distilled Water to produce 16 oz. Measure 5 oz. of the Water; place the Tragacanth in a dry mortar and triturate with a little of the Cod-Liver Oil; then add the yolks of Eggs, and stir briskly, adding Water as the mixture thickens. When of a suitable consistence, add the remainder of the Oil and Water alternately, with constant stirring, avoiding frothing. Transfer to a pint bottle, add the Elixir of Saccharin, Tincture of Benzoin, Spirit of Chloroform, and Oil of Almonds, previously mixed; shake well, and add Distilled Water if necessary to make the product measure 16 oz.

**Dose.**—2 to 8 drachms.

Pancreatised Cod-Liver Oil is prescribed under the impression that it is more easily digested than Cod-Liver Oil alone.

**MORRHUOL.**—Cod-Liver Oil treated first with aqueous solution of Carbonate of Sodium, at a low temperature, to remove the acids, then agitated with Rectified Spirit; the Alcoholic Solution, subjected to distillation, yields Morrhuol. Brown Oil yields 4½ to 6 p. c., the straw coloured 2½ to 3 p. c.—*Y.B.P.* '86, 234.

Proposed as a substitute for Cod-Liver Oil, but without the Carbo-hydrates, and owing to its small bulk is adapted for administration in capsules.

**Dose.**—3 grains.

## MOSCHUS.

### MUSK.

The inspissated and dried secretion from the preputial follicles of *Moschus moschiferus*.

The Musk-deer is a native of the mountainous regions of Central Asia; imported from China and India.

In irregular, somewhat unctuous grains of a reddish-brown or reddish-black colour, having a strong and peculiar odour; contained in a roundish or oval sac from about 1½ to 2 inches in diameter.

It should be free from earthy impurities.

There may be considerable moisture in Musk, amounting to 30 per cent.

Dan. and Ger. specify that it should be practically free from moisture and yield not more than 8 per cent. of ash; Ital., 6 per cent. of ash; U.S., 8 per cent. of ash.

(In all the Pharmacopœias except Austr.; Fr., Musc; Port., Almiscar; Span., Almizcle.)

**Medicinal Properties.**—Stimulant and antispasmodic. Useful in hysteria and epilepsy.

**Dose.**—5 to 10 grs.

Musk 12, Acacia 3, and Liquorice 3, both in powder, forms a good **pill.**

### Not Official.

**MISTURA MOSCHI.**—Musk, 3; Acacia, 3; Sugar, 3; Rose Water, 160; triturate the Musk with the Sugar, then with the Acacia; add the Rose Water gradually.

**Dose.**—1 to 2 oz.

**TINCTURA MOSCHI.**—Musk, 60 grs.; Rectified Spirit, 10 oz.: digest seven days, and strain.

Belg., Fr., Ital., and Port.—Musk, 1; Spirit, 10.
Dan., Dutch, Ger., Russ., and Swiss.—Musk, 1; Spirit, 25; Water, 25.
Span.—Musk, 1; Spirit, 25.
U.S.—Musk, 5; Water, 45; Alcohol, 45; Diluted Alcohol to measure 100.
All by weight except U.S.

## MUCILAGINES.

### MUCILAGES.

Mucilages are employed more as vehicles than as remedies. Mucilage of Acacia is sometimes given to relieve irritating cough, but more generally to render Oils and solutions of Resins miscible with Water; *see* Acacia. M. Amyli, for Enemas; M. Tragacanthæ, for Lozenges, and also for suspending heavy powders in mixtures, in preference to M. Acaciæ. The following Mucilages are Official:—

MUCILAGO ACACIÆ.
MUCILAGO AMYLI.
MUCILAGO TRAGACANTHÆ.

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## MYRISTICA.

### NUTMEG.

The dried seed of *Myristica fragrans*, divested of its hard coat or shell.

It is cultivated in the Banda Islands of the Malayan Archipelago, imported from Sumatra and the Molucca Islands.

Nutmegs yield about 5 per cent. of ash.

(Austr., Dutch, Ger., Russ., Swed., and Swiss, Semen Myristicæ; Belg. and Hung., Nux Moschata; Fr., Muscade; Ital., Noce Moscata; Port., Noz Moschada; Span., Nuez Moscada; U.S., Myristica; not in Dan. or Norw.)

**Medicinal Properties.**—Aromatic, stimulant, and carminative. Frequently used to cover the taste of Rhubarb and other medicines. The expressed and Volatile Oils have been much used in lotions for the hair.

**Dose.**—5 to 15 grs.

Contained in Pulvis Catechu Compositus, Pulvis Cretæ Aromaticus, Spiritus Armoraciæ Compositus, Tinctura Lavandulæ Composita.

### Preparations.

**OLEUM MYRISTICÆ.**

The Oil distilled in Britain from Nutmeg.

Sp. g. varies considerably; we have seen it as low as ·880, and as high as ·925.

**Solubility.**—In all proportions of Absolute Alcohol; 1 in 4½ of Rectified Spirit; sparingly in Proof Spirit.

**Dose.**—1 to 4 minims on Sugar, or in **pill** with Liquorice powder and Soap, *see* p. 405.

(Austr., Dutch, Ger., Hung., Russ., and Swiss, Oleum Macidis; Belg., Essentia Macidis; Dan., Norw., and Swed., Ætheroleum Macidis; Port., Essencia de Noz Moschada; U.S., Oleum Myristicæ; not in Fr., Ital. or Span.)

Contained in Sp. Ammon. Aromat. and Pilula Aloes Socotrinæ.

**OLEUM MYRISTICÆ EXPRESSUM.** *B.P.Syn.*—MYRISTICÆ ADEPS.

A concrete Oil, of a firm consistence and orange colour, obtained from Nutmeg by expression and heat.

(Austr. and Russ., Ol. Myristicæ Expressum; Belg. and Ger., Ol. Nucistæ; Dutch, Norw., Swed. and Swiss, Oleum Myristicæ; Fr., Beurre de Muscade; Port., Oleo de Noz Moschada; Span., Aceite de Nuez Moscada; not in the others.)

Contained in Emplastrum Calefaciens and Emplastrum Picis.

**SPIRITUS MYRISTICÆ.**

Volatile Oil of Nutmeg, 1; Rectified Spirit, 49: dissolve.

**Dose.**—30 to 60 minims. =(1 in 50).

(U.S., 5 in 100; not in the other Pharmacopœias.)

Used in the preparation of Mistura Ferri Composita.

# MYRRHA.

MYRRH.

A gum-resinous exudation from the stem of *Balsamodendron myrrha.* Collected in Arabia Felix and Abyssinia.

In irregular-shaped masses, of a reddish-yellow or reddish-brown colour.

**Solubility.**—Myrrh contains from 40 to 65 p.c. of gum soluble in Water, the remainder consisting of resin is mostly soluble in Alcohol.

(In all the Pharmacopœias except Hung.)

**Medicinal Properties.**—A stimulant tonic. Useful in asthma and chronic catarrh; also in chlorosis and defective menstruation. Locally to aphthæ of mouth and gums.

**Dose.**—10 to 30 grs.

Contained in Decoctum Aloes Compositum, Mistura Ferri Composita, Pilula Aloes et Myrrhæ, Pilula Asafœtidæ Composita, Pilula Rhei Composita.

## Preparation.

### TINCTURA MYRRHÆ.

Myrrh, in coarse powder, 1; Rectified Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator, and when it ceases to drop pour on the remaining Spirit, press the marc, filter, and add Rectified Spirit to make 8. =(1 in 8).

**Dose.**—$\frac{1}{2}$ to 1 drm.

Mixed with water for a gargle; also with solution of Borax for a mouth wash.

(Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S., 1 in 5; all by weight except U.S.; not in Hung.)

## Not Official.

**GARGARISMA MYRRHÆ.**—Tincture of Myrrh, 1; Honey, 1, Infusion of Roses, 18: mix.

**TINCTURE OF MYRRH AND BORAX.**—*See* Borax.

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## Not Official.

# NAPHTHALENE.

$C_{10}H_8$, eq. 128.

Purified Naphthalene occurs in white micaceous scales, with a characteristic odour, melting at 98° C.

**Solubility.**—Insoluble in Water; soluble 1 in 25 of Rectified Spirit; 1 in $1\frac{1}{2}$ of Chloroform; 1 in 3 of Ether; 1 in $7\frac{1}{2}$ of Oil of Turpentine; 1 in 8 of Olive Oil; slightly soluble in Glycerine.

**Test.**—Should dissolve colourless in warm concentrated Sulphuric Acid if quite pure, but a decided pinkish tint is observed if the sample contains 1 per cent. of impurity, and the coloration becomes deeper pink, or even brown, the greater the proportions of foreign matter present.—*Allen.*

(Austr., Dutch, Ger., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Insecticide. Employed locally with success in scabies as a 10 or 20 per cent. **solution** in oil. In other skin diseases, especially those in which large surfaces are exposed, it is to be avoided.—*L.* '82, ii. 909.

In catarrhal conditions of the intestines, also in vesical catarrh. *Adult dose*, 60 to 75 grs. daily.—*A.J.P.*, '84, 645; *L.* '85, ii. 404.

As an antiseptic for wounds.—*L.* '85, ii. 821; *B.M.J.*, '86, i. 217.

In dysentery, 7 or 8 grs. to 1 oz. of water for an enema.—*L.* '88, i. 1327; *T.G.* '85, 412.

In typhoid fever.—*T.G.* '85, 676; *L.* '89, ii. 659, 720.

In doses of 23 grs. per diem.—*L.* '86, ii. 745.

In single doses of 15 grs., or daily doses of 75 grs.—*T. G.* '86, 243.

### Preparations.

**NAPHTHALINUM PRÆCIP.**—A fine powder, obtained by dissolving the crystals in hot Alcohol and pouring into a quantity of cold Water. Recommended as less irritating than the powdered crystals.

**PULVIS NAPHTHALINI** (*Rossbach*).—Purified Naphthalene, 75 grs.; Sugar, 75 grs.; Oil of Bergamotte, ½ min.; divide into twenty powders.

In vesical catarrh.—*L.* '85, i. 360.

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Not Official.

## NAPHTHOL.

BETA-NAPHTHOL.

$C_{10}H_7,HO$, eq. 144.

There are two isomeric Naphthols, $\alpha$ and $\beta$, bearing the same relation to Naphthalene as Phenol does to Benzol. When no prefix is attached to the name, Beta-Naphthol should be used. The name is also written Naphtol.

Small white crystalline scales, almost free from odour.

It is distinguished from its isomer **Alpha-Naphthol** by its melting at 123° C., giving a pale yellow colour with bleaching powder, and a pale green with Ferric Chloride. Alpha-Naphthol melts at 95° C., gives a dark violet with bleaching powder, and a red with Ferric Chloride.

**Sodium-Naphthol** (**microcidin**) readily soluble in Water, **Benzonaphthol**, and **Naphthol Camphor** have also been introduced as possessing similar antiseptic properties to Naphthol; **A-Oxynaphthoic Acid** forms soluble salts with alkalies, which are antiseptics.

**Solubility.**—Nearly insoluble in Water; soluble 1 in 2 of Rectified Spirit; 3 in 4 of Ether; 1 in 24 of Chloroform; 1 in 12 of Olive Oil; 1 in 40 of Glycerine.

Aqueous solution of Boric Acid will dissolve comparatively small quantities of Naphthol.

(Austr., Dan., Dutch, Ger., Hung., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—A powerful disinfectant. Has been given in 5 grain doses for diarrhœa in children. Best administered dissolved in Oil, which is then emulsified.

It is very effective in parasitic diseases and in chronic eczema.—*M.T.* '82, ii. 505.

Daily dose of 38 grs. will produce intestinal antisepsis.—*T.G.* '88, 120.

In typhoid fever.—*B.M.J.* '88, ii. 1226; '92, i. 442; *L.* '90, i. 1407.

As a vermifuge, 4 grs. three times a day.—*L.* '93, i. 377.

For Scabies.—$\beta$-Naphthol, 15; Pulv. Cretæ Alb., 10; Sapo virid., 50; Lard, 100.

For Pediculi.—$\beta$-Naphthol, 5; Olive Oil, 50.

For Pityriasis Versicolor.—$\beta$-Naphthol, 2; Spir. Lavand., 10; Sapo virid., 100.—*M.T.* '82, ii. 505.

**UNGUENTUM NAPHTHOLI** (*B.S.H.*). *Syn.* — KAPOSI'S OINTMENT. — Beta-Naphthol, 60 grs.; Prepared Lard, 1 oz.

**BETOL.**—Salicylate of β-Naphthol Ether. In tasteless, small white crystals, insoluble in Water, soluble in Alcohol and fixed Oils. Recommended in rheumatism, cystitis and intestinal catarrh.—*P.J.* xviii. 264.

**Dose.**—$2\frac{1}{2}$ to 8 grains as a **powder**, or in **pills** with Glucose.

In **pencils** for gonorrhœa containing 20 per cent. of Betol made with Oil of Theobroma.

## NECTANDRÆ CORTEX.

### BEBEERU BARK.

The dried bark of *Nectandra Rodiæi.*

The bark of the Greenheart Tree, is imported from British Guiana. It is intensely bitter and contains an alkaloid Beberine (p. 122).

(Port., Beberu; not in the other Pharmacopœias.)

**Medicinal Properties.**—Tonic and antiperiodic. Used in remittent and intermittent fevers, though not to be relied on as a substitute for Cinchona.

**BEBERINÆ SULPHAS.**—*See* BEBERINÆ SULPHAS.

### Not Official.

## NICKEL.

A metal closely allied to Cobalt, with which it is generally associated in minerals. Commercially it is largely contaminated with Copper, Iron, and sometimes Cobalt. Alloyed with Copper and Zinc, it forms **German silver.** Easily soluble in mineral acids, forming salts of a characteristic green colour.

**NICCOLI BROMIDUM.**—Soluble in Water, Alcohol, and Ether.

Sedative. Recommended in Epilepsy.

**Dose.**—$\frac{3}{4}$ gr. in **pills**, with powdered Althæa and Ext. Gentian.—*L.M.R.* '87, 108.

**SYRUPUS NICCOLI BROMIDI.**—Granulated Nickel, 137 grs.; Bromine, 377 grs.; Water, 12 oz.; digest them in a pint flask at a gentle heat until reaction ceases, filter, add Sugar 24 oz. and sufficient Water to make 32 fl. oz.

Each fluid drachm contains 5 grs. of Bromide of Nickel, which is an average dose. —*A.J.P.* '86, 592.

**NICCOLI SULPHAS.**—Greenish blue crystals, readily soluble in Water.

**Dose.**—$\frac{1}{2}$ to 1 gr. two or three times a day given in chlorosis; is best given on a full stomach, as on an empty one it is apt to produce nausea.

### Not Official.

## NITRO-GLYCERINE.

*Syn.*—TRINITRATE OF GLYCERYL. GLONOIN. TRINITRIN.

$C_3H_5(NO_3)_3$.

When pure it is a heavy colourless Oil. Sp. g. 1·6. Explodes violently on percussion, and under some circumstances spontaneously. It solidifies at 46° F., and is then more dangerous to handle.

A **10 per cent. solution** in Spirit is commercial, and is used in making the Lozenges.

**Solubility.**—Very slightly soluble in Water; readily in Alcohol; mixes with Ether and Chloroform.

**Medicinal Properties.**—Chiefly given for angina pectoris. It reduces arterial tension in contracted kidney.

**Dose.**—$\frac{1}{200}$ to $\frac{1}{50}$ gr., the average dose being $\frac{1}{100}$ gr., generally given as 1 per cent. solution in Rectified Spirit, on Sugar or diluted with Water.

The solution is preferable to the tablet.—*L.* '85, ii. 546; *L.* '89, i. 1238.

### Official Preparations.

**LIQUOR TRINITRINI.** *B.P.Syn.*—LIQUOR NITROGLYCERINI; LIQUOR GLONOINI.

Pure Nitroglycerine, 1 part, by weight; Rectified Spirit, sufficient to produce 100 fluid parts: dissolve. Sp. g. ·844. =(1 in 100).

**Dose.**—½ to 2 minims.

(Dutch (Solutio Nitroglycerini), 1 in 100; U.S. (Spiritus Glonoini), 1 in 100; not in the others.)

**TABELLÆ NITROGLYCERINI.**

Tablets of Chocolate, each weighing 2½ grs. and containing $\frac{1}{100}$ gr. of pure Nitroglycerine.

**Dose.**—1 or 2 tablets.

**Antidotes.**—Ergot, Atropine, Strychnine, cold applications to the head.

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## NUX VOMICA.

NUX VOMICA.

The seeds of *Strychnos Nux-vomica.*

Imported from the East Indies.

The chief source of Strychnine and Brucine.

The total alkaloids have been found to vary between 1·25 and 3·9 per cent. (some Ceylon Seeds gave 5·3 per cent.), but the value of total alkaloids as a medicinal standard is considerably reduced by the fact that the ratio of Strychnine to Brucine may vary as much as 3 : 1, and 1 : 2.

(Austr., Dutch, Ger., Swiss and Russ., Semen Strychni; Belg., Dan., Fr. (Noix Vomique), Hung., Ital. (Noce Vomica), Norw., Port. (Noz Vomica), Span. (Nuez Vomica), Swed. and U.S.)

**Medicinal Properties.**—In very small doses, tonic. In larger doses it operates on the whole system through the spinal motor nerves, indicated by involuntary muscular contractions. Useful in palsy, chorea, and all paralytic affections, and in cases of feeble muscular contractility. It is recommended in atonic dyspepsia, and in debilitated conditions of the alimentary canal. Generally prescribed in the form of Extract and Tincture.

**Dose.**—Of the powder, 1 to 3 grs.

**Antidotes.**—Emetic of Sulphate of Zinc, Mustard, or Ipecacuanha, or hypodermic injection of Apomorphine; Animal Charcoal; Bromide of Potassium or Chloral; Nitrite of Amyl inhalations; Chloroform or Ether to relax the muscles; hypodermic injection of Curare.—*Murrell.*

## Preparations.

### EXTRACTUM NUCIS VOMICÆ.

Nux Vomica, 16; Rectified Spirit, 64; Distilled Water, 16. Heat the previously split Seeds to a temperature of 212° F. (100° C.) for three hours, and then reduce to a fine powder. Mix the Spirit with the Water, and make the powdered Nux Vomica into a paste with 20 of the mixture. Allow this to macerate for twelve hours, then transfer to a percolator, and add another 20 of the mixture. When this has percolated, pour on the remainder of the Diluted Spirit in successive portions; press the marc, filter the expressed liquor, and add it to the percolated liquid.

Take of this liquid 1 fl. oz., and estimate the amount of total alkaloid in the following way:—Evaporate almost to dryness over a water-bath, dissolve the residue in 2 fl. drms. of Chloroform and half a fl. oz. of Diluted Sulphuric Acid, with an equal bulk of Water; agitate and warm gently. When the liquors have separated, draw off the Chloroform, and add to the acid liquor excess of Solution of Ammonia and half a fl. oz. of Chloroform; well agitate, gently warm, and, after the liquors have completely separated, transfer the Chloroform to a weighed dish, evaporate over a water-bath, and dry for one hour, at 212° F. (100° C.). Allow the residue of total alkaloid to cool, and then weigh.

Take of the percolated liquid as much as contains 131¼ grains of total alkaloid, distil off the Spirit, and evaporate over a water-bath until the extract weighs 2 oz. This extract will contain 15 per cent. of total alkaloid.

**Test.**—10 grains of the Extract when treated in the following manner should yield 1½ grain of total alkaloid. Dissolve the Extract in half a fl. oz. of Water, heating gently if necessary, and add a drm. of Carbonate of Sodium previously dissolved in half a fl. oz. of Water, and half a fl. oz. of Chloroform; agitate, warm gently, and separate the Chloroform. Add to this half a fl. oz. of Diluted Sulphuric Acid with an equal bulk of Water; again agitate, warm, and separate the acid liquor from the Chloroform. To this acid liquor add now an excess of Ammonia, and agitate with half a fl. oz. of Chloroform; when the liquors have separated, transfer the Chloroform to a weighed dish, and evaporate the Chloroform over a water-bath. Dry the residue for one hour, and weigh.

**Dose.**—¼ to 1 gr. Often with Aloes and Ipecacuanha.

(Austr., Belg., Dan., Dutch, Ger., Hung., Russ., Swiss and U.S. use 68 to 70 per cent. Alcohol; Fr., Ital. and Span., 80 per cent.; Norw. and Swed., 65 per cent.; Port., 90 per cent. U.S., has also a **Fluid Extract.**)

### TINCTURA NUCIS VOMICÆ. *N.O.Syn.*—TINCTURA STRYCHNI.

Extract of Nux Vomica, 133 grs.; Distilled Water, 4 oz.; Rectified Spirit, a sufficiency: mix sufficient of the Spirit with the Water to produce 20 oz., and dissolve the Extract in the mixture.

1 fl. oz. of this tincture will contain 1 gr. of the alkaloids of Nux Vomica.

**Dose.**—10 to 20 minims.

(Austr., Dan., Ger., Ital., Norw., Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Port. and Span., 1 in 5; prepared from the **seeds.** Dutch, 1 Extract in 100; U.S., 1 Extract in 50; all by weight except U.S.)

STRYCHNINE.—*See* STRYCHNINA.

### Not Official.

**BRUCINE** ($C_{23}H_{26}N_2O_4.4H_2O$).—Colourless crystals, containing about 15 p. c. of Water, which quickly effloresce in dry air.

The presence of 5 p. c. of Strychnine in Brucine can be detected by the reaction with Sulphuric Acid and Bichromate of Potassium.—*P.J.* xxiv. 2.

**Solubility.**—But slightly soluble in Water; 1 in 20 of Rectified Spirit, 1 in 2 of Chloroform, with separation of the combined Water. Its salts are bitter, and most of them crystallisable. They are distinguished by giving a deep red with strong Nitric Acid, changing to violet on the addition of Chloride of Tin.

It possesses powerful analgesic properties, in 5 per cent. solutions of the Sulphate or Nitrate applied locally.—*T.G.* '85, 376; '86, 18.

## OLEA.

### OILS.

The term **Oleum** is applied to an Oil (whether expressed or distilled) in Austr., Brit., Dutch, Ger., Hung., Russ. and U.S.; the other names for fixed and volatile Oils respectively are:—Belg., **Oleum** and **Essentia**; Dan., Norw. and Swed., **Oleum** and **Aetheroleum**; Fr., **Huile** and **Huile Volatile**; Ital., **Olio** and **Essenza**; Port., **Oleo** and **Essencia**; Span., **Aceite** and **Esencia.**

The following are the Oils of the British Pharmacopœia, and will be found under the names of the substances from which they are derived; an average percentage yield is also given:—

| | Per cent. |
|---|---|
| OLEUM AMYGDALÆ. Expressed from the seed | 42 |
| OLEUM ANETHI. Distilled from the fruit | 2·8 to 3 |
| OLEUM ANISI. Distilled from the fruit and imported | 2 |
| OLEUM ANTHEMIDIS. Distilled from the flowers | 0·75 |
| OLEUM CADINUM. Destructive distillation of Wood. | |
| OLEUM CAJUPUTI. Distilled from the leaves and imported. | |
| OLEUM CARUI. Distilled from the fruit | 5 |
| OLEUM CARYOPHYLLI. Distilled from the flower-bud | 16 |
| OLEUM CINNAMOMI. Distilled from the bark. | |
| OLEUM COPAIBÆ. Distilled from the oleo-resin | 35 to 45 |
| OLEUM CORIANDRI. Distilled from the fruit | 0·6 |
| OLEUM CROTONIS. Expressed from the seeds | 25 |
| OLEUM CUBEBÆ. Distilled from the unripe fruit | 11 |
| OLEUM EUCALYPTI. Distilled from the leaves and imported. | |
| OLEUM JUNIPERI. Distilled from the unripe fruit | 0·8 |
| OLEUM LAVANDULÆ. Distilled from the flowers | 1·5 |
| OLEUM LIMONIS. Expressed or distilled from the fresh peel. | |
| OLEUM LINI. Expressed from the seeds without heat. | |
| OLEUM MENTHÆ PIPERITÆ. Distilled from the fresh herb. | |
| OLEUM MENTHÆ VIRIDIS. Distilled from the fresh herb. | |
| OLEUM MORRHUÆ. Extracted from the fresh liver by heat | 42 |
| OLEUM MYRISTICÆ. Distilled from the seed kernel | 5·5 |

| | Per cent. |
|---|---|
| OLEUM MYRISTICÆ EXPRESSUM. Expressed from the seed with heat | 13 |
| OLEUM OLIVÆ. Expressed from the ripe fruit and imported. | |
| OLEUM PHOSPHORATUM. | |
| OLEUM PIMENTÆ. Distilled from the unripe berry | 4 |
| OLEUM PINI SYLVESTRIS. Distilled from the fresh leaves. | |
| OLEUM RICINI. Expressed from the seeds and imported. | |
| OLEUM ROSMARINI. Distilled from the flowering tops | 0·5 |
| OLEUM RUTÆ. Distilled from the fresh herb. | |
| OLEUM SABINÆ. Distilled from fresh tops. | |
| OLEUM SANTALI. Distilled from the wood . . . 2 to 4, sometimes | 4½ |
| OLEUM SINAPIS. Distilled with water from the seeds of Black Mustard after the expression of the fixed oil. | |
| OLEUM TEREBINTHINÆ. Distilled from Turpentine and imported. | |
| OLEUM THEOBROMATIS. Expressed with heat from the seeds | 25 |

## Not Official.

## OLEATES.

Some of these preparations have come into general use. They were originally made by dissolving the oxide of the metal, or an alkaloid, in an excess of Oleic Acid; but more recently Dr. Shoemaker proposed the method of precipitation by double decomposition between a salt of the base and Solution of Castile Soap (Oleate of Sodium with a little Palmitate); Solution of Oleate of Potassium may be used with advantage in place of the Solution of Castile Soap, when the pure Oleate is required. The Oleate can also be purified from Palmitate by solution in Benzin.

The various Oleates will be found under the headings of their respective bases.

## OLIVÆ OLEUM.

### OLIVE OIL.

The Oil expressed from the ripe fruit of *Olea Europæa.* Pale yellow or greenish-yellow.

Chiefly obtained from the south of Europe. Sp. g. about 0·915.

Congeals partially at about 36° F. (2·2° C.).—*Brit. Pharm.*

The above congealing point seems to be generally accepted, but we think it requires modification. The congealing point depends greatly upon the length of time to which the Oil is exposed to cold. For instance, an Oil cooled by Ether to 9° F. remained unchanged, but when kept at 32° F. for four hours it partially solidified. Some samples of Oil pressed by ourselves, from Olives grown in the South of France, showed no sign of congelation during six hours at 32° F., or three hours at 15° F.; on the other hand, in the following year an Oil from the same district (guaranteed pure) set at once when cooled quickly to 13° F., and within two hours at 32° F. We have since discovered that the non-freezing oil is only produced when the fruits have been allowed to over-ripen.

**Solubility.**—1 in 2 of Ether; partially in Rectified Spirit.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port. (Azeite), Russ., Span. (Aceite), Swed., Swiss and U.S.)

**Test.**—Adulteration of Olive Oil is very general, large quantities of Cotton Seed and other oils being used for admixture; probably the two most useful tests are Conroy's and Bechi's (*C.D.* '89, i. 333); later Conroy has given the following modification of Bechi's test (*C.D.* '90, ii. 728) which appears to answer very well:—

1. Make a test solution containing 5 of Silver Nitrate and 1 of Nitric Acid (sp. g. 1·42) in 100 parts of Rectified Spirit.

2. Pour about 100 grains of the Oil under examination into a dry test-tube about half an inch in diameter, add to it 10 grain-measures of the above test solution, and place the tube in boiling water for five minutes.

Pure Olive Oil does not darken in colour, but if it contain Cotton Seed Oil it assumes a more or less brown colour, according to the amount present.

**Medicinal Properties.**—Nutritious and mildly laxative, demulcent in the form of emulsion. Has also been successfully given for ascarides, followed by a purge. Used in laxative enemata. It is most extensively employed in pharmacy, in the preparation of liniments, ointments, and plasters.

Recommended in the treatment of gall stones. 30 oz. taken in five doses.—*B.M.J.* '88, i. 933; *T.G.* '88, 785.

On the contrary it is stated to favour the production of gall stones.—*L.* '89, ii. 710.

**Dose.**—½ to 1 oz.

Used in the preparation of Enema Magnesii Sulphatis, Linimentum Ammoniæ, Linimentum Calcis, Linimentum Camphoræ, Sapo Durus, Sapo Mollis, some Emplastra and Unguenta.

## OPIUM.

### OPIUM.

The juice obtained in Asia Minor by incision from the unripe capsules of *Papaver somniferum*, inspissated by spontaneous evaporation.

Any ordinary variety of Opium may be employed as a source of alkaloids, and of Extract of Official strength; but, when otherwise used for officially recognised purposes, Opium must be that obtained in Asia Minor, and must be of such a strength that when dried and powdered and the powder heated to 212° F. (100° C.) until it ceases to lose moisture, and the product tested by the appended method, or any trustworthy method, it shall yield as nearly as practicable 10 per cent. of Morphine; that is, 100 parts of such dry powdered Opium shall yield not less than 9·5 parts, and not more than 10·5 parts, of Morphine.

Apart from the general outcry which resulted in the alteration referring to Extractum Opii (which see) much adverse criticism followed the fixation of the Official Standard at 10 per cent. Morphine.

It was shown that genuine Smyrna Opium might be expected to yield 11 to 14 per cent. of Morphine, and also that from Turkey in Europe large supplies were drawn equal in quality and more uniform than from Turkey in Asia. The general opinion was that the Pharmacopœial restrictions were far too narrow, and that the adoption of such a low standard not only offered a direct premium to adulteration, but rendered sophistication of some kind an all but absolute necessity. —*P.J.*, xvi. 410, 417; *C.D.* '86, i. 329; '89, i. 762.

(The following are the requirements of the foreign Pharmacopœias:—Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Port., Russ. and Span., not less than 10 per cent.; Swed., 9 to 11 per cent.; Fr. and Swiss, 10 to 12 per cent.; U.S., 13 to 15 per cent.; all calculated on dried Opium.)

**Test.**—Take of Opium, dried at 212° F. (100° C.), 140 grs.; freshly Slaked Lime, 60 grs.; Chloride of Ammonium, 40 grs.; Rectified Spirit, Ether, and Distilled Water, of each a sufficiency. Triturate together the Opium, Lime, and 400 grain-measures of Distilled Water in a mortar until a uniform mixture results; then add 1000 grain-measures of Distilled Water and stir occasionally during half an hour. Filter the mixture through a plaited filter, about three inches in diameter, into a wide-mouthed bottle or stoppered flask (having the capacity of about 6 fl. oz. and marked at exactly 1040 grain-measures) until the filtrate reaches this mark. To the filtered liquid (representing 100 grs. of Opium) add 110 grain-measures of Rectified Spirit and 500 grain-measures of Ether, and shake the mixture; then add the Chloride of Ammonium, shake well and frequently during half an hour, and set it aside for twelve hours. Counterbalance two small filters; place one within the other in a small funnel, and decant the ethereal layer as completely as practicable upon the inner filter. Add 200 grain-measures of Ether to the contents of the bottle and rotate it; again decant the ethereal layer upon the filter, and afterwards wash the latter with 100 grain-measures of Ether added slowly and in portions. Now let the filter dry in the air, and pour upon it the liquid in the bottle in portions, in such a way as to transfer the greater portion of the crystals to the filter. When the fluid has passed through the filter, wash the bottle and transfer the remaining crystals to the filter, with several small portions of Distilled Water, using not much more than 200 grain-measures in all, and distributing the portions evenly upon the filter. Allow the filter to drain, and dry it, first by pressing between sheets of bibulous paper, and afterwards at a temperature between 131° and 140° F. (55° and 60° C.), and finally at 194° to 212° F. (90° to 100° C.). Weigh the crystals in the inner filter, counterbalancing by the outer filter. The crystals should weigh 10 grs., or not less than 9½ and not more than 10½ grs., corresponding to about 10 per cent. of Morphine in the dry powdered Opium.

About 1½ grains of Morphine is lost in the above process, owing to its solubility.

The precipitate, if pure Morphine, should be soluble in Lime Water, should yield no ash, and should titrate to the gravimetric figure with standard Acid.

The excellent method of Teschemacher and Smith will be found, *P.J.* xix. 45 and 82, with a modification by Dott, *P.J.* xxii. 747, and a further modification by Wright and Farr, *C.D.* '93, i. 78; it gives higher results than the Official process, and is here copied from the last reference:—

10 grammes of Opium in powder is exhausted by boiling with successive small quantities of Proof Spirit until exhausted. The different fractions are mixed, 1 or 2 drops of Solution of Ammonium Oxalate added, and the tincture almost neutralised with Ammonia. It is then concentrated by evaporation to one-third, allowed

to cool, and filtered. The filtrate is concentrated to about 5 c.c. transferred to a small flask, 4 c.c. of Water and 3 c.c. 90 per cent. Alcohol being used to wash the capsule; 2 c.c. Solution of Ammonia ·960 is then introduced, along with 25 c.c. of Absolute Ether. The flask is closed with a well-fitting cork, and shaken so as to mix the contents. After eighteen hours, the Ether is decanted as completely as possible, the precipitate collected on counterpoised filters, and washed with Morphinated Water. It is then dried, washed with Benzene, dried and weighed, and finally titrated with $\frac{N}{10}$ Sulphuric Acid.

W. & F. found it preferable to dissolve the precipitate in excess of the volumetric Acid, and titrate back with $\frac{N}{10}$ Soda Solution (recently standardised). Either Litmus or Methyl Orange may be used as the indicator; but should the latter be employed, it is better to fix the end reaction by placing several drops of the indicator side by side on a white slab, and testing a drop of the liquid after each addition of the titre, until the point of neutrality is reached.

Each c.c. of the volumetric solution represents ·0049 gramme $H_2SO_4$, and is equivalent to ·0303 gramme Morphine Hydrate.

The Morphinated Water is made by digesting an excess of pure Morphine in Distilled Water for several days, shaking occasionally and then filtering.

**Medicinal Properties.**—Opium produces three main physiological effects:—It diminishes pain. It causes sleep. It arrests secretion, excepting that of the skin, which it promotes.

In small doses it excites the vascular and nervous systems, increasing the rapidity and fulness of the pulse; this is followed by sleep, accompanied with perspiration. It is apt to produce nausea, headache, thirst, and constipation. If the dose be large, the sleepiness becomes intense, and there is difficulty in waking the patient. By continued use, it impairs the appetite, digestion, and intellect. It also acts on the respiratory system, diminishing the frequency of respirations, and thus impairing the oxidation of the blood. Great caution should be exercised in giving Opium to infants and young children, as they are very susceptible to its action.

**Dose.**—Of the powder, ½ to 3 grs.

For **pills**, 25 grains of powdered Opium with 1 minim of Syrup and 1 minim of water will form a nice pill mass.

**Incompatibles.**—The Alkaline Carbonates, Lime Water, Salts of Lead, Iron, Copper, Mercury, and Zinc, Liquor Arsenicalis, and all astringent Vegetables.

**Antidotes.**—In case of poisoning by Opium, the antidotes are an emetic of 10 grs. of Sulphate of Copper, the stomach pump, external stimulants, cold affusion, Ammonia to the nostrils, compelled exertion, and artificial respiration. Belladonna or hypodermic injection of Atropine is also recommended; Strychnine; Nitrite of Amyl; Gelsemium.

## Preparations.

### CONFECTIO OPII.

Compound Powder of Opium, 100 grs.; Syrup, 300 grs.: mix.
=(1 of Powder of Opium in 40).

**Dose.**—5 to 20 grains.

**Tablets** of Confection of Opium are small hard cylinders, about one inch long, and weighing 20 grs. Are recommended to be taken for a "nightcap" in Brandy and Water.

### EMPLASTRUM OPII.

Opium in very fine powder, 1; Resin Plaster, 9: melt the Resin Plaster by the heat of a water-bath, add the Opium by degrees, and mix thoroughly. =(1 in 10).

Anodyne, to relieve local pain.

(Belg., 1 Opium in 20; Fr., 3 Extract in 4; Port. and Span., 1 Extract in 10; Swiss, 1 Extract in 20; U.S., 1 Extract in 16; not in the others.)

### ENEMA OPII.

Tincture of Opium, ½ drm.; Mucilage of Starch, 2 oz.: mix for one enema.

(Not in the other Pharmacopœias.)

### EXTRACTUM OPII. [STANDARDISED.]

Opium, 16 oz.; Distilled Water, 6 pints (120 oz.): macerate the Opium in 2 pints (40 oz.) of the Water twenty-four hours, and express the liquor. Reduce the residue of the Opium to a uniform pulp, macerate it again in 2 pints (40 oz.) of the Water for twenty-four hours, and express. Repeat the operation a third time. Mix the liquors, strain through flannel, and evaporate by a water-bath until the product weighs about 8 oz.

B.P. states that it should contain 20 per cent. of Morphine, when analysed as described under "Opium."

In the first issue of B.P. 1885, the extract was directed to be made from "Opium in powder" and restricted to the Official variety; but the criticism evoked was so strong, that in the later reprints it was permitted to use any variety of Opium as long as the product conformed to the Official standard of Morphine.

This is less stimulating than powdered Opium, and is preferred as a direct sedative.

100 of good Opium yield 50 of extract.

**Dose.**—½ to 1 gr. or more.

(Austr., Belg., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., Swiss, and U.S.; not in Dan., Norw., or Swed.)

### EXTRACTUM OPII LIQUIDUM.

Extract of Opium, 1; Distilled Water, 16; Rectified Spirit, 4: macerate the Extract of Opium in the Water for an hour, stirring frequently; then add the Spirit and filter. The product should measure 20. =(1 oz. Ext. in 20 oz.).

It contains 22 grains of Extract of Opium, nearly, in one fluid ounce. Specific gravity from ·985 to ·995. Analysed as described under "Opium," this Liquid Extract should yield about 1 per cent. of Morphine.

Contains 1 grain of Extract in 22 minims.

**Dose.**—10 to 40 minims.

### LINIMENTUM OPII. Deposits a good deal when kept.

Tincture of Opium, 1; Liniment of Soap, 1: mix and filter. =(1 in 2).

The addition of the Opium to the Soap Liniment renders it more useful in many cases of rheumatism and local pains.

(Not in the other Pharmacopœias.)

**PILULA SAPONIS COMPOSITA.** *B.P.Syn.*—Pilula Opii.

Opium, in powder, 1; Hard Soap, in powder, 4; Glycerine, a sufficiency: mix the Soap with the Opium, and add Glycerine sufficient to make a pill mass. =(About 1 Powder of Opium in 5½).

Anodyne and soporific.

**Dose.**—3 to 5 grains.

(Pil. de Cynoglosso, Belg. and Fr., 1 Extract in 10, Dan., about 1 in 7; Norw., 1 Opium in 7½; Span., 1 Extract in 11; Port. (Pilulas de Opio Comp.), 1 Extract in 10; U.S. (Pilula Opii), Powdered Opium 6½, Soap 2; not in the others.)

**PULVIS OPII COMPOSITUS.**

Opium, 3; Black Pepper, 4; Ginger, 10; Caraway Fruit, 12; Tragacanth, 1; all in powder: mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle. =(1 of Powder of Opium in 10).

The dry ingredients for making Confectio Opii.

**Dose.**—2 to 5 grains.

**TINCTURA OPII.** *B.P.Syn.*—Laudanum. *N.O.Syn.*—Tinctura Thebaica.

Opium, in powder, 1½; Proof Spirit, 20: macerate seven days in a closed vessel, with occasional agitation; then strain, press, filter, and add sufficient Proof Spirit to make 20. =(1 oz. in 13⅓ oz.).

It contains the soluble matter of 33 grains of the Opium, nearly, in one fluid ounce; or about 3·3 grains of Morphine in one fluid ounce, or about 0·75 per cent. of Morphine, or about 1¼ per cent. of Bimeconate of Morphine, besides the other alkaloidal salts of Opium.—*Brit. Pharm.*

It was shown at 1890 B.P. Conference that the Official method of preparing this tincture only resulted in the extraction of about three-fourths of the Morphine. In connection with some legal prosecution it has been more recently asserted, *C.D.* '92, ii. 282, that Opium of the B.P. Standard would only yield an average of ·57 per cent., with a maximum of ·68 and a minimum of ·51 per cent., showing the absurdity of an Official Standard and test being fixed by calculation alone without experimental confirmation.

More recently (*C.D.* '93, i. 78) it has been stated that to obtain the Official Standard percentage of Morphine, ·75 in Tincture of Opium, it would be necessary to employ Opium containing not less than 12·5 per cent. of Morphine.

**Dose.**—5 to 40 minims.

(Austr., Dan., Dutch, Ger., Hung., Ital., Norw., Russ., Swed., Swiss and U.S., 1 (powder) in 10; Belg., 1 in 11·9; Span., 1 in 12; Fr., 1 Extract in 12; Port., 1 Extract in 20; all by weight except U.S.)

**TINCTURA OPII AMMONIATA.** The Scotch Paregoric. Deposits much when kept.

Opium, in powder, 100 grs.; Saffron, cut small, 180 grs.; Benzoic Acid, 180 grs.; Oil of Anise, 60 minims; Strong Solution of Ammonia, 4 oz.; Rectified Spirit, 16 oz.: macerate seven days in a well-closed vessel, with occasional agitation, strain, press, filter, and add sufficient Rectified Spirit to make 20 oz.

=(1 gr. Powdered Opium in 96 mins).

It contains the soluble matter of ·62 grain of the Opium in a fluid drachm, or 5 grains in a fluid ounce.

**Dose.**—$\frac{1}{2}$ to 1 drm.

(Russ. similar to Brit., but uses Oil of Fennel in place of Oil of Anise; not in the others.)

### TROCHISCI OPII.

Lozenges made of Extract of Opium, Tincture of Tolu, Sugar, Gum Acacia, and Extract of Liquorice.

Each lozenge contains $\frac{1}{10}$ grain of Extract of Opium, or $\frac{1}{50}$ grain of Morphine.

**Dose.**—1 to 6 lozenges.

(U.S., Powdered Opium $\frac{1}{13}$ grain in each; not in the others.)

### VINUM OPII.

Deposits a good deal when kept.

Extract of Opium, 1 oz.; Cinnamon Bark, bruised, 75 grs.; Cloves, bruised, 75 grs.; Sherry Wine, 20 oz.: macerate for seven days, in a closed vessel, with occasional agitation, and filter.

=(about 1 oz. Extract in 20 oz.).

It contains 22 grains of Extract of Opium, nearly, in one fluid ounce. Each fluid drachm contains about half a grain of Morphine.

(Dan., Ital., Norw., Swed., Swiss and U.S., 1 (powder) in 10; Dutch, 1 and 5; Fr., 1 in 8; Belg., with aromatics, 1 *Extract* in 15, and without 1 strained Opium in 12; Port., 1 Extract in 20; all by weight except U.S.; for formulæ *see* Sydenham's Laudanum, p. 384.

**Dose.**—10 to 40 minims.

Used as a **collyrium**, 1 to 16 of Water.

**Vinum Opii Brit. Ph. 1864** is without aromatics, and is therefore preferred by some oculists; the formula is as follows:—

Opium, in powder, $1\frac{1}{2}$; Sherry, 20: macerate seven days, and filter.

=(1 powder in $13\frac{1}{3}$).

| Other preparations containing Opium. | Proportions of Opium in the mass. |
|---|---|
| PILULA IPECACUANHÆ CUM SCILLA | 1 in 23 nearly. |
| PILULA PLUMBI CUM OPIO | 1 in 8. |
| PULVIS CRETÆ AROMATICUS CUM OPIO | 1 in 40. |
| PULVIS IPECACUANHÆ COMPOSITUS | 1 in 10. |
| PULVIS KINO COMPOSITUS | 1 in 20. |
| SUPPOSITORIUM PLUMBI COMPOSITUM | 1 gr. in each. |
| TINCTURA CAMPHORÆ COMPOSITA | $\frac{1}{4}$ gr. in 1 fl. drm. |
| UNGUENTUM GALLÆ CUM OPIO | 1 in $14\frac{2}{3}$. |

| | Proportions of Morphine in the mass. |
|---|---|
| MORPHINÆ ACETATIS INJECTIO HYPODERMICA | 1 in 10. |
| MORPHINÆ ACETATIS LIQUOR | 1 in 100. |
| MORPHINÆ BIMECONATIS LIQUOR | 1 in 80. |
| MORPHINÆ HYDROCHLORATIS LIQUOR | 1 in 100. |
| SUPPOSITORIUM MORPHINÆ | $\frac{1}{2}$ gr. in each. |
| SUPPOSITORIUM MORPHINÆ C. SAPONE | $\frac{1}{2}$ gr. in each. |
| TROCHISCI MORPHINÆ | $\frac{1}{36}$ gr. in each. |
| TROCHISCI MORPHINÆ ET IPECAC. | $\frac{1}{36}$ gr. in each. |

### Not Official.

**AQUA OPII.**—Dried Opium, 1; Water, 12: distil 6.

Occasionally employed in eye lotions. Aq. Opii, 1: Aq. Sambuci, 7.

**UNGUENTUM OPII.**—Extract of Opium, 1; Simple Ointment, 9: rub the Extract with a small quantity of Water to a syrupy consistence, and mix with the Ointment. =(1 in 10).

**SOLUTION OF BIMECONATE OF MORPHIA** (Squire.) *See* also p. 365.—Same strength and same dose as Tincture of Opium. This was introduced into medicine by the Author in 1839; it possesses in an eminent degree the sedative powers of Morphine. Dr. Roots thus writes of it:—"I have taken it myself daily now very nearly four years, and during that period I have frequently prescribed it in my private practice. The result of my observations of its effects on myself and others amounts to this, namely, that it disturbs the head less, that it distresses the stomach less, and that it constipates the bowels less, than any other preparation of Opium. I have taken every other preparation of Opium, but from none of them have I obtained the same degree of quiet rest that I have enjoyed from this Bimeconate of Morphia."

The Author here records the case of a lady who had taken this preparation from 1841 to 1869, a period of twenty-eight years. The late Dr. Chambers and Mr. Benjamin Phillips attended her; they quite thought that she could not live three months, and they decided that full doses of this preparation should be tried. At length enormous doses were given, *a fluid ounce six times in the twenty-four hours.* The result of this was an entire cessation both of the hæmorrhage from the lungs and the night perspirations, and she began to gain flesh. After some years the dose was diminished gradually till it amounted to 6 drms. twice in the twenty-four hours, and to this she strictly adhered up to the time above mentioned.

**MECONII PERIODIDA.**—Under this name we have made (by request) a preparation representing the alkaloids of the above preparation in combination with excess of Iodine, on the lines of the other Di-iodo-hydriodides previously introduced by us.

**Dose.**—⅛ to ½ grain.

**LIQUOR OPII SEDATIVUS** (*Battley*) has enjoyed a reputation for a long time as an anodyne and sedative superior to Tincture of Opium, but it is somewhat stronger, say, 50 per cent. Dose 10 to 20 minims.

**SYDENHAM'S LAUDANUM.**—Contains Saffron, and occurs in the majority of the foreign Pharmacopœias under the following titles, and are all by weight.

**Tinctura Opii Crocata.** Sydenham's Laudanum.

Austr.—Opium 15, Saffron 2, Alcohol 15, Cinnamon Water to make 150.
Hung.—Opium 15, Saffron 15, Cinnamon Water, 150.
Ger.—Opium 15, Saffron 5, Cloves 1, Cassia 1, Alcohol (68 p. c.) 75, Water 75.
Russ.—Opium 15, Saffron 5, Cloves 1, Cassia 1, Alcohol (70 p. c.) 90, Water 90.
Swiss.—Opium 10, Saffron 3, Cloves 1, Cassia 1, Alcohol (95 p. c.) 45, Water 50.

**Laudanum Sydenhami.**

Belg.—Extract of Opium 67, Saffron 34, Oil of Cloves 1¼, Water 380, Cinnamon Water 90, Alcohol (60 p. c.) to make 1000.

**Laudanum de Sydenham.**

Fr.—Opium 40, Saffron 20, Cloves 3, Cinnamon 3, Grenache Wine 320.

**Vinum Thebaicum Crocatum.**

Dan.—Opium 100, Saffron 25, Cloves 6, Cinnamon 6, Malaga Wine 1000.
Norw. and Swed.—Opium 15, Saffron 5, Cloves 1, Cinnamon 1, Malaga Wine 150.

**Vinum Opii Aromaticum.**

Dutch.—Saffron 4, Cloves 1, Cinnamon 1, Alcohol (70 p. c.) 10, Malaga Wine 90, to 95 of this Liquor add Opium 10.

**Vinho de Opio Composto.**

Port.—Extract of Opium 5, Saffron 3, Cloves 1, Cinnamon 1, Madeira Wine 100.

**Vino de Opio Compuesto.**

Span.—Opium 15, Saffron 7½, Cloves 1, Cinnamon 1, White Wine 135.

**Vino Oppiato Composto.**

Ital.—Opium 16, Saffron 8, Cinnamon 1, Cloves 1, Marsala Wine 144.

**Vinum Opii.**

U.S.—Opium 10, Cassia 1, Cloves 1, Alcohol 15, White Wine to measure 100.

**Dose.**—5 to 20 minims.

**BLACK DROP.**—Acetum Opii Crocatum.

1 drop is equal to 4 drops of Tincture of Opium.

**Dose.**—1 to 8 minims.

**LINIMENTUM OPII AMMONIATUM** (*B.P.C.*)—Liniment of Soap, 6; Compound Camphor Liniment, 6; Tincture of Opium, 6; Liniment of Belladonna, 1; Stronger Solution of Ammonia, 1: mix and, after standing a week, filter quickly.

**NARCEINA.**—Discovered by Pelletier, in 1832. In white, silky, acicular crystals: neutral, with a slightly bitter taste. Soluble in 375 parts of cold and in 220 of hot Water, also in Alcohol; insoluble in Ether, and practically insoluble in Chloroform. It is considered by some observers to possess hypnotic properties.

Dilute Sulphuric Acid added to Narceine, then concentrated over a water-bath, gives rise to a beautiful violet colour, which changes to cherry red on further heating. If to this red liquid when cooled a trace of Nitric Acid is added, blue violet streaks appear.—*P.R.* '87, 215.

Narceine should not melt under 165° C. Chemically pure Narceine should be free from Acid, and complete fusion should not take place under 170° C.—*P.J.* xix. 1034.

(Belg. and Fr.; not in the others.)

**NARCOTINA.**—First noticed by Derosne, in 1803. Crystallises in prisms, reaction neutral. Insoluble in Water; soluble in Ether, in boiling Alcohol, in diluted acids; insoluble in solution of Potash. Forms a yellow solution with Nitric Acid. It has no narcotic properties, and has therefore been called Anarcotina; it has been given in 5-grain doses as a substitute for Quinine.

**PAPAVERINA.**—Discovered by Dr. Merck. In white crystalline needles. Insoluble in Water; sparingly soluble in Alcohol and Ether. According to Merck, when moistened with strong Sulphuric Acid, it becomes dark blue, but Hesse states that pure Papaverine dissolves colourless in that acid cold, but when heated becomes dark violet.

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## OS USTUM.

### BONE ASH.

The residue of bones which have been burned to a white ash in contact with air. It consists principally of Phosphate of Calcium mixed with about 10 per cent. of Carbonate of Calcium, and a little Fluoride of Calcium, Silica, and Phosphate of Magnesium.

(Fr., Os Calcinés; Port., Ossos Calcinados; Span., Huesos Calcinados; Swed.; not in the others.)

Used to prepare Calcii Phosphas and Sodii Phosphas.

# OVI ALBUMEN.

EGG ALBUMEN.

The liquid white of the egg of *Gallus Bankiva,* var. domesticus.

(Fr. and Port.; not in the others.)

# OVI VITELLUS.

YOLK OF EGG.

The yolk of the egg of *Gallus Bankiva,* var. domesticus.

Contained in Mistura Spiritus Vini Gallici.

# OXYMEL. *See* MEL.

# OXYMEL SCILLÆ. *See* SCILLA.

Not Official.

# PANCREATIC ENZYMES.

Pancreatic juice has been found to possess four distinct properties: conversion of starch, conversion of proteids, emulsification of fats, and curdling of milk.

Each of these properties is attributed to a peculiar soluble ferment or enzyme.

The enzymes of the pancreatic juice act only in neutral or alkaline solutions. Their action is suspended in feebly acid solutions, and when digested at 40° C. (104° F.) for an hour in a solution of pepsine of the normal acidity of the stomach (equal to ·2 p.c. Hydrochloric Acid), or when digested with some gastric juice, they are destroyed. They are also destroyed in solution by heating to 71° C. (160° F.).

**TRYPSIN** acts slowly on solid albuminoid masses (boiled egg-albumen), but with great rapidity on soluble albumens, such as the casein of milk. It converts albumens into peptones and subsequently into bodies which are not proteids, Leucine, Tyrosine, &c.

**PANCREATIC DIASTASE** converts starch into dextrin and maltose.

It is usually stated to be identical with the diastase of Malt, but it cannot be so, as we find that it is affected quite differently to the latter by acid and alkali. Diastase from either source acts most rapidly in solutions which are practically neutral. The Malt ferment is retarded by acid, but almost stopped by a very small quantity (about ·1 p.c.) of alkali; the Pancreatic ferment on the contrary is retarded by alkali and almost stopped by a minute quantity of acid.

**EMULSIVE ENZYME**, fresh pancreatic tissue or pancreatic juice, emulsifies fats, but it is very doubtful whether any extract or solution prepared from the pancreas has the same property.—*Sir W. Roberts.*

Foster states that pancreatic juice splits up neutral fats into their respective acids and glycerine, but Roberts has failed to corroborate this with pancreatic tissue or pancreatic extract.

Pancreatic digestion in the human body is an intestinal one, it takes place in the duodenum; another intestinal ferment exists in the small intestine which converts cane-sugar into invert-sugar.

As both pancreatic diastase and trypsin have been shown by Roberts to be destroyed in the stomach, they are useless for internal administration, but they are peculiarly suited for peptonising, or artificially digesting, foods for the use of the sick.

(U.S. Pancreatinum; not in the other Pharmacopœias.)

**LIQUOR PANCREATICUS.**—The pancreas, preferably of the pig, is first well freed from fat, then cut up into small pieces, and finally mixed with four times its weight of Dilute Spirit (Rectified Spirit 1, Water 3) in a covered vessel; it should be well agitated at least once a day; at the end of a week it should be strained through muslin and then filtered till bright.

**PEPTONISED MILK.**—A pint of milk is diluted with 4 oz. of water and heated to 140° F. (60° C.).* To this add two teaspoonfuls of the Liquor Pancreaticus and 20 grains of Bicarbonate of Sodium. Place in a jug and cover with a "cosey" to keep it warm. At the end of an hour, or rather more, boil the contents of the jug. The product can be used like ordinary milk.

Peptonised Milk can also be prepared at about 60° to 65° F. Dilute a pint of Milk with half-a-pint of Lime Water, or with half-a-pint of water containing 20 grains of Bicarbonate of Sodium in solution; to this add three teaspoonfuls of Liquor Pancreaticus: the mixture is set aside in a jug for three or four hours, by which time the milk will have developed a slightly bitter taste and will be ready for use.

The bitter taste is well covered by Soda Water, or it may be warmed and sweetened for infants.

If it is used when ready it need not be boiled, but if not it must be boiled to prevent the change proceeding far enough to render it unpalatable.

**PEPTONISED GRUEL.**—Gruel from wheaten flour, oatmeal, arrowroot, sago, pearl barley, pea or lentil flour, should be very well boiled and made thick and strong. It is then poured into a covered jug and allowed to cool to a lukewarm temperature. Liquor Pancreaticus is then added, two teaspoonfuls to a pint of gruel. At the end of three hours the product is boiled and strained. The starch of the meal is converted into sugar, and the albuminoid matters are peptonised.

**PEPTONISED MILK-GRUEL.**—To a good thick gruel, prepared from any of the above-mentioned farinaceous articles, while still hot, add an equal quantity of cold milk; the mixture will be about 125° F. (52° C.). To each pint of this mixture add two teaspoonfuls of Liquor Pancreaticus and 20 grains of Bicarbonate of Sodium. Set aside in a warm place for two or three hours until a perceptible bitterness is developed and not longer, then heat to the boiling point and strain.

**PEPTONISED BEEF-TEA.**—Half-a-pound of finely minced lean beef is mixed with a pint of water and 20 grains of Bicarbonate of Sodium. This is simmered for two hours in a covered saucepan; the resulting beef-tea is decanted off into a covered jug, the undissolved beef residue is then beaten up with a spoon into a pulp and added to the beef-tea. When it has cooled down to about 140° F. (60° C.) a tablespoonful of the Liquor Pancreaticus is stirred in. The mixture is kept warm for two or three hours and occasionally stirred. At the end of this time the contents of the jug are boiled briskly for two or three minutes and finally strained. Beef-tea prepared in this way is rich in peptone, and when seasoned with salt is scarcely distinguishable in taste from ordinary beef-tea.

**PEPTONISED NUTRITIVE ENEMATA.**—The enema may be prepared in the usual way with milk-gruel and beef-tea, and a dessertspoonful of Liquor Pancreaticus should be added to it just before administration.

In the warm temperature of the bowel the ferments find a favourable medium for their action on the nutritive materials with which they are mixed.

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* If a thermometer is not handy, the proper temperature may be obtained by boiling one-half of the mixture and adding it to the other half which is cold.

It must be borne in mind that peptonised foods are very liable to change on keeping, and that fresh quantities should be prepared every twelve hours or they must be re-boiled.—*Sir W. Roberts, Lumleian Lectures*, 1880.

**PANCREATISED FAT or PANCREATIC EMULSION.**

The process of making Purified Pancreatic Emulsion is divided into three parts.—*See Proceedings of the Royal Society*, 1867.

1. To make CRUDE EMULSION:—

Fresh Pancreas of the pig freed from fat and all extraneous matter, 25 lbs.; Lard 20 lbs., Water, 3 gallons: bruise the Pancreas in a marble mortar, then add the lard, beat and mix well together, adding the water little by little as it becomes absorbed till 3 gallons are used. Strain by squeezing through muslin.

2. To make PANCREATISED FAT:—

Treat the Crude Emulsion with Ether, in the proportion of three parts of Ether to one of Emulsion. Mix well, and allow the mixture to stand till two strata are formed, —(*a*) an ethereal solution of pancreatised fat at the top, (*b*) a watery stratum at the bottom. Decant the ethereal stratum and filter, put it into a proper still, and recover the Ether by distillation. The result is Pancreatised Fat.

3. To make PURIFIED PANCREATIC EMULSION:—

Pancreatised Fat, 2; Rectified Spirit, 1; Distilled Water, 3; Oil of Cloves, a sufficiency: mix gradually in a marble mortar, adding the Spirit and Water little by little, and enough Oil of Cloves to give a slight flavour.

**Tests.**—The "Pancreatised Fat," when made into Lead Plaster by Oxide of Lead, should yield Glycerine.

The "Watery Stratum" left after decanting the ethereal stratum of pancreatised fat (No. 2) should yield no Glycerine.

The "Purified Pancreatic Emulsion" should be permanent, and should have an acid reaction.

**Dose.**—From 1 to 4 drms. mixed in milk or water, from once to four times in twenty-four hours.

Not Official.

## PAPAIN.

*Syn.*—PAPAYOTIN.

A digestive ferment extracted from Papaw juice (*Carica papaya*).

An amorphous powder, more or less white.

It dissolves animal proteids, and acts best in neutral or slightly alkaline solutions.

The products of the action of Papain on boiled white of egg, in neutral solution, are described (*P.J.* xxiv. 632), peptone was not produced.

Its solution is stated to dissolve false membranes in croup and diphtheria, and to be a good application to ulcers.—*L.* '85, ii. 86; '87, ii. 164; *B.M.J.* '85, ii. 151; '88, i. 1296; *T.G.* '86, 406; *P.J.* xv. 507; xx. 227.

**Dose.**—2 to 10 grains.

## PAPAVERIS CAPSULÆ.

POPPY CAPSULES.

The nearly ripe capsules of the White Poppy, *Papaver somniferum*, dried; from plants cultivated in Britain.

(Austr., Belg., Dan., Dutch, Fr. (Pavot), Ger., Hung., Ital. (Papavero), Port. (Dormideiras), Russ., Span. (Adormidera) and Swiss; not in the others.)

**Medicinal Properties.**—Similar to Opium, but much weaker and of uncertain strength.

### Preparations.

### DECOCTUM PAPAVERIS.

Poppy Capsules, bruised, 2; Distilled Water, 30: boil ten minutes in a covered vessel, and strain; then pour over the contents of the strainer as much Distilled Water as will make the strained product 20. =(1 in 10).

An external soothing application, applied warm.

(Span., Infusion, 1 in 35; not in the other Pharmacopœias.)

### EXTRACTUM PAPAVERIS.

Poppy Capsules, freed from seeds, in No. 20 powder, 16; Rectified Spirit, 2; boiling Distilled Water, a sufficiency: mix the Poppy Capsules with 40 of the Water, stirring them frequently during twenty-four hours, then pack in a percolator, and pass Water slowly through them until about 160 have passed through, or until the Poppy Capsules are exhausted. Evaporate the liquor by a water-bath to 20; when cold, add the Spirit. After twenty-four hours, filter the liquid and evaporate on a water-bath to a pill consistence.

**Dose.**—2 to 5 grs.

(Belg., Fr. and Span.; not in the others.)

### SYRUPUS PAPAVERIS.

Poppy Capsules, freed from seeds and reduced to No. 20 powder, 36; Rectified Spirit, 16; Refined Sugar, 64; boiling Distilled Water, a sufficiency. Infuse the Poppy Capsules in 80 of the Water for twenty-four hours, stirring frequently, then pack in a percolator, and adding more of the Water, allow the liquor slowly to pass until 320 have been collected, or the Poppies are exhausted; evaporate the liquor by a water-bath until it is reduced to 60; when quite cold, add the Spirit, let the mixture stand for twelve hours, and filter. Distil off the Spirit, evaporate the remaining liquor to 40, and then add the Sugar; the product should weigh 104, and its sp. g. be about 1·330. =(1 in nearly $2\frac{1}{4}$).

**Dose.**—1 drm.; 10 to 20 minims for children, increasing cautiously in consequence of their susceptibility to the influence of Opium.

In this process the Spirit is added to the cooled decoction, and thus coagulates the gummy matters; the filtered liquor, now being made into a syrup with the Sugar, will be preserved from fermentation even in hot weather.

(Austr., Dutch, Ger., and Russ., 1 in 10; Belg., Syr. Diacodii with alcoholic *extract* and simple syrup, 1 in 100; Dan., about 1 in 12; Fr., Sirop de Pavot Blanc, 1 of extract of Poppy in 100; Hung., Syr. Diacodii, 1 in 27; Port., Xarope de Dormideiras, 1 in $13\frac{1}{2}$; Span., Jarabe de Adormideras, 1 extract in 100; not in Ital., Norw., Swed., Swiss or U.S.)

### Not Official.

**EXTRACTUM PAPAVERIS LIQUIDUM.**—The liquid obtained by the process for making the Syrup (previous to adding the Spirit and the Sugar), 3; Rectified Spirit, 1: mix.

**Dose.**—30 to 60 minims.

*Decoctum Concentratum* is the liquid extract without the spirit.

## PARAFFINUM DURUM.

HARD PARAFFIN.

*B.P.Syn.*—Paraffin; Paraffin Wax; Solid Paraffin.

A mixture of several of the harder members of the Paraffin series of hydrocarbons; usually obtained by distillation from shale, separation from the liquid oils by refrigeration, and purification of the solid product.

Colourless, semi-transparent, crystalline, inodorous, and tasteless. Slightly greasy to the touch. Sp. g. ·82 to ·94. It should leave no residue on ignition.

**Melting point.**—A very wide range is given in the B.P. from 110° to 145° F. (43·3° to 62·8° C.), and the consistency of the **Ointments** may vary considerably. There is also a great difference in the commercial value of Paraffin melting at 110° and that at 145° F.

**Solubility.**—Insoluble in Water, sparingly soluble in Absolute Alcohol.

It is Officially described as freely soluble in Ether, but this depends largely upon the melting point of the sample; one at 110° F. is immediately and wholly soluble 1 in 20, but in one at 120° the solubility is very partial, it dissolves to some extent at first and comes out again on standing.

(Belg., Dutch, Ger., Hung., and Russ., all Paraffinum Solidum (m.p. 74° to 80° C.); Fr. Paraffine (m.p. 44° to 65° C.); U.S. Petrolatum Spissum (m.p. 45° to 51° C.); not in the others.)

Used in the preparation of Unguentum Acidi Borici, U. Acidi Carbolici, U. Acidi Salicylici, U. Eucalypti, U. Glycerini Plumbi Subacetatis, U. Hydrargyri Oxidi Rubri, U. Potassæ Sulphuratæ, U. Sulphuris Iodidi, U. Veratrinæ.

## PARAFFINUM MOLLE.

SOFT PARAFFIN.

*B.P.Syn.*—Petrolatum; Pétroléine; Unguentum Paraffinum.

Called Vaselinum and Vaselina in some of the foreign Pharmacopœias.

A semi-solid mixture containing some of the softer or more fluid members of the Paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of Petroleum. It is known in commerce by various fanciful names.

White or yellowish, translucent, soft, greasy; free from acidity, alkalinity, or any unpleasant odour or flavour, even when warmed to 120° F. (48·9° C.). It is not saponified by solutions of alkalies.

Sp. g. at the melting point, ·840 to ·870. Melts at 95° to 105° F. (35° to 40·5° C.), or even somewhat higher; volatilises without giving acrid vapours, and burns with a bright flame, leaving no residue.

It sometimes shows a strong fluorescence when melted.

Dispensing difficulties frequently arise in regard to the colour of ointments of which this preparation is an ingredient. The B.P. states "white or yellowish," leaving the colour an open question; it has been customary to confine the white variety to otherwise uncoloured mixtures, but, although the custom is good, it is not universal.

The U.S.P. is equally indefinite as to colour, but this is not of so much consequence, seeing that the substance is not used in a single Official ointment. As it is largely used in B.P. Ointments, it would have been better to have indicated the colour.

The name "Vaseline," when unqualified, is restricted to the yellow variety, the white being distinguished as "White Vaseline."

**Solubility.**—Insoluble in Water, slightly soluble in Absolute Alcohol, freely in Ether, Chloroform, Benzol, Oil of Turpentine, the fixed and volatile oils.

**Tests.**—If 5 grms. be digested for half-an-hour with 5 grms. of Caustic Soda and 25 c.c. of Water, the aqueous layer separated and supersaturated with Sulphuric Acid, no oily substance should separate (absence of fixed oils or fats, of vegetable or animal origin, or of resin).

If 2 volumes of concentrated Sulphuric Acid be added to 1 volume of melted Paraffin, in a test tube placed in hot water, and the contents occasionally agitated during fifteen minutes, the Acid should not acquire a deeper tint than brown, nor lose its transparency (limit of readily carbonizable, organic impurities).

(Austr., Dan. and Swiss, Vaselinum; Belg., Paraffina Mollis; Dutch, Vaselinum Album and V. Flavum; Fr., Pétroléine; Ger. and Russ., Unguentum Paraffini; Hung., Ital., and Span., Vaselina; U.S., Petrolatum Molle; not in the others.)

Used in the preparation of Unguentum Acidi Borici, U. Acidi Carbolici, U. Acidi Salicylici, U. Eucalypti, U. Glycerini Plumbi Subacetatis, U. Hydrargyri Oxidi Rubri, U. Hydrargyri Nitratis Dilutum, U. Potassæ Sulphuratæ, U. Sulphuris Iodidi, U. Veratrinæ, U. Zinci Oleati.

### Not Official.

**MASSA PARAFFINUM.**—Hard Paraffin (m.p. 120° F.), 1; Soft Paraffin $1\frac{1}{2}$; melt together.

A good mass for making Nitrate of Silver and Permanganate of Potassium into Pills.

**PARAFFINUM LIQUIDUM.**—A limpid, oily liquid, neutral reaction, without odour, taste, and fluorescence.

Sp. g. about ·880. Boiling not lower than 360° C.

(Belg., sp. g. ·840; Dan., sp. g. ·895—·905; Dutch, sp. g. ·840—·860; Ger. and Russ., sp. g. ·880; U.S., sp. g. ·875—·945).

It dissolves Bromine, Iodine, Iodoform, and Phosphorus; also Ether, Chloroform, fixed and essential Oils, Eucalyptol, Menthol, and Thymol.

**Tests.**—Same as given above.

**Medicinal Properties.**—It has been used, alone or mixed with Castor or Olive Oil, as an application in chronic eczema accompanied by desquamation. Has been recommended as a base for the hypodermic administration of those substances which it dissolves.

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## PARALDEHYDUM.

### PARALDEHYDE.

$C_6H_{12}O_3$.

A product of the polymerisation of Aldehyde by various Acids or Salts.

A clear colourless liquid, having a characteristic ethereal odour and a burning and afterwards a cooling taste.

**Solubility.**—B.P., 1 in 10 of Water at 60° F., less soluble in hot water. It is miscible, in all proportions, with Rectified Spirit, or with Ether.

The **solubility** in water at 60° F. is really 1 in 8½, the solution becoming very turbid on warming.

**Tests.**—Sp. g. ·998. Boiling point 255·2° F. (124° C.). It begins to congeal to a clear crystalline mass at 50° F. (10° C.). An aqueous solution should have a neutral reaction. It affords no coloration on standing for two hours mixed with a solution of Potash or Soda, nor any precipitate with a solution of either Chloride of Barium or Nitrate of Silver.

The tests above given are in the main those to be expected from a good commercial sample.

By careful fractionation, Paraldehyde may be obtained **melting** at 54½°—55° F., having a **boiling point** 125°—126° C., and **sp. g.** ·999. In taking the **freezing point** it must be noticed that Paraldehyde will not "congeal to a crystalline mass at 50° F.," unless the liquid be vigorously stirred or a Paraldehyde crystal be dropped in while at that temperature. Under ordinary circumstances it will be cooled considerably below its melting point before crystallisation commences, and then the temperature will rise to the point indicated.—*C.D.* '90, ii. 852.

The **Aldehyde reaction** with Potash is an exceedingly delicate one, almost too delicate, very few samples remaining quite uncoloured for two hours.

An impure Paraldehyde can generally be brought up to the standard by washing with Water containing an excess of Sodium Bicarbonate to remove acidity, and then dehydration over dried Carbonate of Potassium. If the melting point be very low it should first be redistilled and the first tenth rejected.

(Dan., Hung., Ger., Russ. and U.S.; not in the others.)

**Medicinal Properties.**—Hypnotic. Gives quiet and refreshing sleep; does not depress the heart's action, but rather strengthens it. Has a marked action on the kidneys increasing the flow of urine. It does not give rise to headache. Is a valuable remedy in mania, melancholia, and other nervous affections accompanied by sleeplessness.

Paraldehyde is given off by the lungs, and may be detected in the breath twelve or more hours after having been taken.

References.—*B.M.J.* '83, i. 215; '85, ii. 99; '89, i. 119, 515; *L.* '85, i. 201; '87, i. 554; '87, ii. 204; '89, ii. 15; '92, ii. 195.

30 minim doses every half or one hour in spasmodic asthma.—*B.M.J.* '93, i. 65.

**Dose.**—30 to 60 (or even 90) minims dissolved in 1 oz. to 2 oz. of water. A smaller dose repeated in an hour is more effective than a large dose. It has a pungent taste, which may be lessened by the addition of Tincture of Orange and Syrup; it is also given in Gin at night. When larger doses than will dissolve are required in mixtures, Compound Tragacanth Powder should be ordered to diffuse it.

### Not Official.

**METALDEHYDE.**—Like Paraldehyde it is a polymer of Aldehyde ($C_2H_4O$.), but its formula is uncertain. It is formed under rather uncertain conditions by the influence of cold upon Aldehyde containing a trace of mineral acid. It occurs in colourless acicular crystals insoluble in Water and sparingly in Alcohol and Ether. It sublimes readily, with partial conversion into ordinary Aldehyde. It is said to be a hypnotic.

# PAREIRÆ RADIX.

PAREIRA ROOT.

The dried root of *Chondrodendron tomentosum.*

Imported from Rio Janeiro in South Brazil. A spurious Pareira has lately been imported from Bahia in North Brazil, much inferior in alkaloid and extractive. The most marked chemical difference between the two is in the Petroleum Ether Extractive. In the genuine drug this amounts to over 8 p. c. and in the spurious to about 0·3 p. c.—*P.J.* xxii. 703, 771.

A good deal of the stem, which closely resembles the root, is also imported, and is said to be much less efficacious. Several drugs have been sold at different times as Pareira Brava.

(Port., Butua; U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Tonic and diuretic. In calculous affections, chronic inflammation, and ulceration of the kidneys and bladder: strongly recommended by the late Sir B. Brodie for its action on the mucous membrane of the bladder.

## Preparations.

### DECOCTUM PAREIRÆ.

Pareira Root, in No. 20 powder, 1¼; Distilled Water, 20: boil fifteen minutes in a covered vessel, then strain, and pour as much Distilled Water over the contents of the strainer as will make the strained product measure 20. =(1 in 16).

(Not in the other Pharmacopœias.)

**Dose.**—1 to 2 oz. three or four times a day.

### EXTRACTUM PAREIRÆ.

Pareira Root, in No. 40 powder, 1; boiling Distilled Water, 10, or a sufficiency: digest the Pareira with 1¼ of Water for twenty-four hours, then pack in a percolator, and add Water, till, by slow percolation, 10 has passed through, or the Pareira is exhausted. Evaporate by a water-bath to a pill consistence.

With a No. 40 powder, such as one obtains from a grinding mill, it is impossible to percolate any large quantity. It is best exhausted by successive digestions and pressings. If the Root be actually boiled with the Water, the Extract is lumpy.

**Dose.**—10 to 30 grs.

### EXTRACTUM PAREIRÆ LIQUIDUM.

Dissolve 4 of Extract of Pareira in a sufficient quantity of a mixture of 1 of Rectified Spirit and 3 of Water, to form 16 of Liquid Extract. Filter if necessary. =(1 Extract in 4).

**Dose.**—½ to 2 drms.

(U.S., 1 in 1 with glycerine; not in the other Pharmacopœias.)

**Incompatibles.**—The persalts of Iron, Salts of Lead, Tincture of Iodine.

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# PEPSIN.

PEPSIN.

A preparation of the mucous lining of a fresh and healthy stomach of the pig, sheep, or calf.

The stomach of one of these animals recently killed having been cut open and laid on a board with the inner surface upwards, any adhering portions of food, dirt, or other impurity, are to be removed, and the exposed surface slightly and rapidly washed with a little cold Water; the cleansed mucous membrane is then to be scraped with a blunt knife or other suitable instrument, and the viscid pulp thus obtained is to be immediately spread over the surface of glass or glazed earthenware, and quickly dried at a temperature not exceeding 100° F. (37·8° C.). The dried residue is to be reduced to powder and preserved in a stoppered bottle.

A light yellowish-brown powder, having a faint but not disagreeable odour, and a slightly saline taste, without any indication of putrescence.

Very little soluble in Water or Spirit.

The usual solvent for fluid preparations of Pepsine is a weak Spirit acidulated with Hydrochloric Acid, to which Glycerine is sometimes added.

Pepsin is one of the soluble ferments or enzymes of the gastric juice. It dissolves natural proteids, albumens, and fibrin, and converts them into syntonin and subsequently into albumose and peptone. It is a conversion of the less soluble proteids into those which are more so, peptone being the most soluble and diffusible of the proteids. Pepsin has no action on starch.

It acts only in acid solution, ·2 p.c. of Hydrochloric Acid being the most favourable.

The action of Pepsin will continue almost indefinitely if the products of its action are removed by dialysis, or if the concentration of the products is reduced by acidified water.

The gastric juice also contains another enzyme "rennin," which curdles milk. The curd is formed in acid or neutral solutions in the presence of Phosphate of Lime. The casein is split up into a soluble and an insoluble proteid, the latter of which entangles the fat and forms a curd.

The importance of Pepsin in aiding digestion has been justly valued by the profession for a very long period; before the method of preserving it was discovered, the scrapings of calves' stomachs were employed when gastric juice was found to be deficient.

When Sir James Clark went to the French Exhibition in 1855 with her Majesty he brought over with him some Pepsine made by M. Boudault, in connection with the experiments of Dr. Corvisart, which enabled the medical men of this country to give it a trial; it has been therefore an established remedy for more than thirty years.

**Tests.**—Two grains of it, with an ounce of Distilled Water, to which five minims of Hydrochloric Acid have been added, form a mixture in which at least 100 grains of hard-boiled white of egg (passed through wire gauze of 36 meshes per linear inch, and made of No. 32 brass or copper wire) will dissolve on their being well mixed, digested, and well stirred together for about thirty minutes, at a temperature of 130° F. (54·4° C.).

For our previous edition we examined 26 samples, including all the well-known brands, English, Continental, and American. The shortest time by the test given above was 18 minutes, four were complete in 20 minutes, six more in 30 minutes, four of the remainder were practically inert.

**Dose.**—2 to 5 grains. Given in **powders,** or in **pills** with "Dispensing Syrup."

The following description and improved test occur in U.S.P. (1893):—

A proteolytic ferment or enzyme obtained from the glandular layer of fresh stomachs from healthy pigs, and capable of digesting not less than 3,000 times its own weight of freshly coagulated and disintegrated egg albumen, when tested by the process given below. If it be desired to use a diluent for reducing Pepsin of a higher digestive power to that required by the Pharmacopœia, Sugar of Milk should be employed for this purpose.

A fine white, or yellowish-white, amorphous powder, or thin, pale yellow or yellowish, transparent or translucent grains or scales, free from any offensive odour and having a mildly acidulous or slightly saline taste, usually followed by a suggestion of bitterness. It slowly attracts moisture when exposed to the air.

Soluble, or for the most part soluble, in about 100 parts of Water, with more or less opalescence; more soluble in Water acidulated with Hydrochloric Acid; insoluble in Alcohol, Ether, or Chloroform.

On heating a solution of Pepsin in acidulated Water to 100° C. (212° F.), it becomes milky or yields a light, flocculent precipitate, and loses all proteolytic power. In a dry state it can bear this temperature without injury.

Pepsin usually has a slightly acid reaction. It may be neutral, but should never be alkaline.

**Valuation of Pepsin.**—Prepare, first, the following three solutions:—

(*a.*) To 294 c.c. of Water add 6 c.c. of Diluted Hydrochloric Acid.
(*b.*) In 100 c.c. of solution *a* dissolve 0·067 grm. of the Pepsin to be tested.
(*c.*) To 95 c.c. of solution *a* brought to a temperature of 40° C. (104° F.) add 5 c.c. of solution *b*.

The resulting 100 c.c. of liquid will contain 0·2 c.c. (0·21 grm.) of absolute Hydrochloric Acid, 0·00335 grm. of the Pepsin to be tested, and 98 c.c. of Water.

Immerse and keep a fresh hen's egg during fifteen minutes in boiling water; then remove it and place it into cold water. When it is cold, separate the white coagulated albumen, and rub it through a clean sieve having 30 meshes to the linear inch. Reject the first portion passing through the sieve. Weigh off 10 grm. of the second, cleaner portion, place it in a flask of the capacity of about 200 c.c., then add one half of the solution *c*, and shake well, so as to distribute the coherent albumen evenly throughout the liquid. Then add the second half of solution *c*, and shake again, guarding against loss. Place the flask in a water-bath or thermostat kept at a temperature of 38° to 40° C. (100·4° to 104° F.) for six hours, and shake it gently every fifteen minutes. At the expiration of this time the albumen should have disappeared, leaving at most only a few thin, insoluble flakes. (Trustworthy results, particularly in comparative trials, will be obtained only if the temperature be strictly maintained between the prescribed limits, and if the contents of the flasks be agitated uniformly and in equal intervals of time.)

The relative proteolytic power of Pepsin stronger or weaker than that described above may be determined by ascertaining, through repeated trials, how much of solution *b*, made up to 100 c.c. with solution *a*, will be required exactly to dissolve 10 grm. of coagulated and disintegrated albumen under the conditions given above.

**Pepsinum Saccharatum,** U.S.—Pepsine (of above strength), 1; Sugar of Milk, 9.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., Swiss and U.S.; not in Norw. or Swed.)

## PHENACETINUM.

PHENACETIN.

$C_{10}H_{13}NO_2$, eq. 179.

*N.O.Syn.*—PARA-ACETPHENETIDIN.

A crystalline substance produced by the action of Glacial Acetic Acid on Para-phenetidin, a body obtained from Phenol.

In the process of manufacture, Nitro-phenols are formed by the action of Nitric Acid on Carbolic Acid. The Ortho-nitro-phenol having been separated from the Para-nitro-phenol, a Sodium salt of this latter is then formed, the Sodium of which is afterwards (by the action of Ethyl Iodide) replaced by Ethyl. By the reducing action of nascent Hydrogen the Nitro-group ($NO_2$) of this compound is transformed to an Amido-group ($NH_2$), forming Para-amidophenetol, otherwise called Paraphenetidin, which finally by treatment with Glacial Acetic Acid yields Para-acetphenetidin or Phenacetin.

Colourless, tasteless, inodorous, glistening scaly crystals.

It is also supplied commercially as a powder.

**Solubility.**—1 in 1700 of Water; 1 in 50 of Boiling Water; 1 in 21 of Rectified Spirit (B.P. 1 in 16); 1 in 100 of Proof Spirit.

**Tests.**—Heated with free access of air, it burns leaving no residue. Sulphuric Acid dissolves it without colour.

One grain boiled with 20 minims of Hydrochloric Acid for about half a minute yields a liquid which, when diluted with ten times its volume of Water, cooled and filtered, assumes a deep-red coloration on the addition of solution of Chromic Acid.

This test distinguishes Phenacetin from the other antipyretics. In the absence of Chromic Acid, Solution of Potassium Bichromate answers equally well.

A cold, saturated aqueous solution should not become turbid on the addition of Bromine Water.

This will detect 1 per cent. of Antifebrin in Phenacetin.

A mixture of 5 grains of Phenacetin with 2 fluid drachms of Solution of Potash boiled, should yield no unpleasant odour when again boiled after the addition of 5 drops of Chloroform.

Unconverted Para-phenetidin, said to be poisonous in very small doses if long continued, may be detected by the intense violet colouration produced by melting, at the temperature of a water-bath, ½ gramme of the sample with 2½ grammes of Chloral Hydrate. Pure Phenacetin will remain unchanged for five minutes, after which a characteristic rose tint is produced, but traces of Para-phenetidin will with certainty produce a violet colour in two or three minutes.—*P.J.* xxi. 878.

(Ger., Russ. and Swiss, Phenacetinum; Ital., Fenacetina; not in the others.)

**Medicinal Properties.**—Anti-pyretic and analgesic. It does not appear to affect healthy persons, but even in small doses it relieves pyrexia. The fall and subsequent rise of temperature are gradual. It does not produce nausea. It has been recommended for the relief of neuralgia.—*L.* '88, i. 489; '88, ii. 322; *B.M.J.* '88, i. 1126; '89, ii. 1417.

Recommended in Influenza to relieve the headache and reduce temperature.—*B.M.J.* '91, i. 1282; '91, ii. 190.

As the result of an enquiry as to the ill-effects of Phenacetin by a Committee of the British Medical Association, it is stated that it appears to have a notable freedom from injurious action, it has great value, especially as an analgesic. Some observers recommend a commencing dose of 5 grains or less, others using doses of 8 to 10 grains.—*B.M.J.* '94, i. 89.

**Dose.**—5 to 10 grains.

It is given in **cachets**, or **suspended** with Compound Powder of Tragacanth.

Not Official.

**PHENOCOLL HYDROCHLORAS.**—A compound closely related to Phenacetin, and obtained by the action of Glycocoll on Phenetidin. A white crystalline powder, soluble 1 in 16 of Water, sparingly soluble in Alcohol.

**Medicinal Properties.**—Antipyretic, yielding good results in rheumatic fever. *L.* '91, i. 1060; '92, ii. 438.

**Dose.**—5 to 10 grains.

**Salocoll,** a recent introduction, is Phenocoll Salicylate, given in doses of 15 to 30 grains.

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# PHENAZONUM.

## PHENAZONE.

*B.P.Syn.*—PHENYL-DIMETHYL-PYRAZOLONE.

$C_6H_5(CH_3)_2C_3HN_2O$. eq. 188.

A crystalline substance obtainable from Phenyl-hydrazine.

In its preparation, Aniline salts are converted by Nitrous Acid into salts of Diazo-benzene, which in their turn are reduced by Sulphurous Acid to salts of Phenyl-hydrazine. By acting on this latter with Aceto-acetic Ether, a compound is formed originally supposed to be Methyl-oxyquinizine, but as it is now considered to relate more closely to Pyrrhol than to Chinoline, it has been re-named Phenyl-methyl-pyrazolone. This compound, by the addition of a second Methyl-group forms Phenyl-dimethyl-pyrazolone, sold under the trade mark "**Antipyrine,**" and now apparently to be known pharmaceutically as Phenazone.

Colourless and inodorous scaly crystals with a bitter taste.

**Solubility.**—1 in 1 of Water; 3 in 4 of Rectified Spirit; about 5 in 6 of Chloroform; 1 in 40 of Ether.

**Tests.**—Melts at about 230° F. (110° C.). Ignited with free access of air, it burns leaving no residue. The aqueous solution is neutral to test-paper and is not affected by Sulphuretted Hydrogen.

One grain of Nitrite of Sodium and 2 drachms of a 1 per cent. aqueous solution of Phenazone yields a nearly colourless liquid which turns deep green on the addition of 10 minims of Diluted Sulphuric Acid.

A few drops of Spiritus Ætheris Nitrosi will answer the same purpose as the Nitrite of Sodium.

An aqueous solution of the above strength mixed with an equal volume of Nitric Acid assumes a yellow colour passing to crimson on warming. Solution of Perchloride of Iron produces in a very dilute aqueous solution a deep red colour, which is nearly discharged by excess of Diluted Sulphuric Acid.

Chloroform extracts Antipyrin from alkaline solutions, but imperfectly from acid solution.

In acidified aqueous solution, it precipitates with Mayer's reagent, and also with Iodine in Potassium Iodide Solution, just like an alkaloid.

(Aust., Dan., Dutch, Ger., Hung., Ital., Russ. and Swiss; not in the others.)

**Medicinal Properties.**—Antipyretic and antiseptic; also anodyne in neuralgia and gout. Given in doses of 60 to 90 grains, generally in 2 or 3 portions at an hour's interval, in powder or solution, the general effect is a depression of temperature for at least five hours. The temperature falls gradually and continuously to the extent of 2° to 4° F., accompanied by a fall in pulse-rate and, in cases of great depression, with profuse sweating. Injected subcutaneously, it has a more powerful and rapid influence, 30 grains thus injected being equal to 60—90 grains taken by the mouth.—*L.* '84, ii. 32.

A specific in acute rheumatism, *L.* '85, ii. 642; *L.* '86, ii. 876; *B.M.J.* '86, ii. 601. An anodyne for neuralgia, *L.* '87, i. 907; in migraine, *L.* '87, ii. 1163; *B.M.J.* '87, ii. 123; *L.* '89, ii. 790; in sciatica, *B.M.J.* '89, i. 610, 710. Relieves ocular pain and ciliary neuralgia in various eye diseases (glaucoma, &c.), *L.* '86, i. 708; *B.M.J.* '88, i. 1360. A uterine sedative, *B.M.J.* '87, ii. 1349. Recommended in hectic fever, *L.* '87, i. 284; *B.M.J.* '85, ii. 602; in hay fever, *B.M.J.* '88, i. 40; in chorea, *L.* '88, i. 39, 157; *L.M.R.* '88, 311; *T.G.* '88, 249; in sunstroke (large doses), *B.M.J.* '87, i. 930; to arrest hæmoptysis, *B.M.J.* '87, ii. 1349; in the early stages of whooping cough, *T.G.* '88, 84, 608; in febrile affections of children, *T.G.* '85, 130; in laryngismus stridulus, *L.* '88, ii. 961; in kidney diseases, *B.M.J.* '88, i. 1185; *L.* '89, ii. 431; in diabetes, *L.* '89, i. 812. A failure in sea-sickness, *M.P.* '88, i. 541. 10 grains daily as an agalactic, *L.M.R.* '88, 290. 50 p. c. solution hypodermically as a local anæsthetic, *B.M.J.* '88, ii. 1124. Sometimes produces a rash resembling measles, *B.M.J.* '87, i. 111, 210. Toxic effects produced, *B.M.J.* '86, ii. 788; '87, ii. 431; '88, i. 243, 258; *L.* '88, i. 364; *T.G.* '87, 542.

It is contra-indicated in cardiac weakness, and cases of extreme exhaustion.—*T.G.* '89, 457; also during the menstrual period, *L.M.R.* '89, 51.

As the result of an enquiry, as to the ill-effects of Phenazone, by a Committee of the British Medical Association, it is stated that the commencing dose should not exceed 10 grains, and should not be repeated too frequently; there is a necessity for watching its action, but ill-effects are not of the frequency or importance ascribed to them by a widespread impression. The large majority of observers agree in stating that they are of no importance whatever, and that, with reasonable and judicious care, they limit in no way the general usefulness of the drug as a therapeutic agent.—*B.M.J.* '94, i. 88.

**Dose.**—3 to 20 grains. Given in **solution,** or in **powders,** or **cachets.**

**Incompatibles.**—Spiritus Ætheris Nitrosi, Tannic Acid in aqueous solutions, Extractum Cinchonæ Liquidum, and other Astringent Decoctions and Infusions. Chloral Hydrate is not incompatible with Phenazone in moderately dilute aqueous solution. Salicylate of Sodium is not incompatible with Phenazone in aqueous solution, but forms an oily liquid if the powders be mixed, and exposed to the air. *P.J.* xx. 861.

### Not Official.

**SALIPYRIN** (Antipyrin Salicylate).—A white crystalline powder, almost insoluble in water, soluble 1 in 4 of Rectified Spirit.

**TOLYPYRIN.**—A body allied to Antipyrine (Phenazone), readily soluble in Water.

Not Official.

## PHLORIDZIN.

A glucoside obtained from various Rosaceous trees.

A light crystalline powder, whitish or pale yellow, slightly soluble in Water, 1 in 5 of Rectified Spirit.

It quiets irritability of the stomach. It induces artificial diabetes.

**Dose.**—5 to 15 grains, in **mixtures**, or in **pills** with Glucose.

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## PHOSPHORUS.

PHOSPHORUS.

P, eq. 31.

A non-metallic element obtained from bones.

A semi-transparent colourless wax-like solid, which emits white vapours when exposed to the air.

Sp. g. 1·770. Melts at 110° F. (43·3° C.), and ignites in the air at a temperature a little above its melting point.

It should always be handled with caution and be cut under water.

**Solubility.**—Slightly soluble in pure Ether; 1 in 25 of Chloroform; 2 in 1 of Bisulphide of Carbon, about 1 in 60 of Olive Oil; also in melted fats; sparingly in boiling Rectified Spirit; insoluble in Water.

(Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Austr. or Hung.)

**Medicinal Properties.**—Given as a nervine tonic; it acts as a powerful general stimulant. Poisonous doses affect principally the kidneys and liver, leading to fatty structural changes. The preparations are Oleum and Pilula Phosphori, and it has been combined with Cod-Liver Oil and other menstrua; should be given with caution.

The Hypophosphites of Sodium and of Calcium are other forms of giving loosely combined Phosphorus.

**Dose.**—$\frac{1}{100}$ to $\frac{1}{30}$ grain, usually given in **pill.**

Used for making Acidum Phosphoricum Concentratum.

**Antidotes.**—Emetics: Sulphate of Copper is both emetic and antidote: 3 grs. dissolved in Water every 5 minutes till vomiting is induced, then continue it in 1 gr. doses every $\frac{1}{4}$ hour, with 10 drops of Solution of Acetate of Morphine if rejected. Half an ounce of Epsom Salts as a purgative. Demulcent drinks but avoid oils and fats. *French* Oil of Turpentine is an antidote.

### Preparations.

### OLEUM PHOSPHORATUM.

Pure dry Phosphorus, 16 grs.; Almond Oil, previously heated to 300° F. (149° C.) for 15 minutes and allowed to cool, and filtered, 4 oz.

Put the Oil into a stoppered bottle capable of holding 4½ oz., and add to it the Phosphorus. Immerse the bottle in hot water until the Oil has acquired a temperature of 180° F. (82·2° C.) removing the stopper two or three times to allow the escape of expanded air, then shake the Oil and Phosphorus together until the latter is entirely dissolved. =(about 1 in 100).

**Dose**—5 to 10 mins.

(Belg., 1 and 100 Olive Oil; Fr. and U.S., 1 in 100 Almond Oil and Ether; Russ., 1 in 100 Almond Oil; not in the others.)

## PILULA PHOSPHORI.

Phosphorus, 3 grs.; Balsam of Tolu, 120 grs.; Yellow Wax, 57 grs.; Curd Soap, 90 grains.

Put the Phosphorus and Balsam of Tolu into a mortar, previously half filled with hot water; when the Phosphorus is melted, and the Balsam has become sufficiently soft, rub them together beneath the surface of the water until no particles of Phosphorus are visible, the temperature being maintained at or near 140° F. (60° C.) Add the Wax, and when it softens blend the whole thoroughly together. Should be kept immersed in water. When dispensed, every 2 grs. of the product is to be incorporated with one grain of Curd Soap, a few drops of Rectified Spirit being used, if necessary, to soften the whole, 3 grains of the mass (including Soap) $=\frac{1}{30}$ grain of Phosphorus.

**Dose.**—2 to 4 grs. =(1 in 90).

(U.S., about $\frac{1}{100}$th grain of Phosphorus in each pill; not in the others.)

### Not Official.

**PILULA PHOSPHORI C. SEVO.**—(1) Phosphorus, 10 grs.; Mutton Suet, 90 grs.; Purified Bisulphide of Carbon, 40 mins. Dissolve the Phosphorus in the Bisulphide of Carbon, and incorporate with the Suet, previously rubbed into a smooth paste. (2) Starch, 60 grains; Powdered Liquorice Root, 60 grs.; Powdered Soap, 40 grs.; Powdered Tragacanth, 12 grs.; Glycerine, 48 mins. Make into a pill mass.

No. 1 should be kept in a stoppered bottle, and incorporated with No. 2 as required for dispensing.

One part of No. 1 with 8 parts of No. 2 will yield a mass of the same strength as the Official formula.

Each 3-grain pill will contain $\frac{1}{30}$th of a grain of Phosphorus.

**ELIXIR PHOSPHORI** (*B.P.C.*).—Compound Tincture of Phosphorus, 1; Glycerine, 4: add the Tincture to the Glycerine, with agitation; should be preserved from the light. Each drachm contains $\frac{1}{50}$ grain of Phosphorus.

**Dose.**—15 to 60 minims.

(U.S. (Elixir Phosphori), contains 21 of Spiritus Phosphori in 100).

**TINCTURA PHOSPHORI COMPOSITA** (*B.P.C.*).—Phosphorus, 12 grs.; Chloroform, $2\frac{1}{2}$ oz.: place in a stoppered bottle and apply the heat of a water-bath until dissolved. Then add the solution to Ethylic Alcohol $12\frac{1}{2}$ oz. Shake well. This tincture should be preserved from the light in accurately stoppered bottles. Each drachm contains $\frac{1}{10}$ grain of Phosphorus.

**Dose.**—3 to 12 minims.

(U.S. (Spiritus Phosphori), 1·2 in 1000.)

### Not Official.

## PHYSALIS ALKEKENGI.

WINTER CHERRY.

The *Solanum Vesicarium* of the old dispensatories.

The ripe berries are full of seeds; they yield half their weight in juice.

(Fr., Alkékenge; not in the other Pharmacopœias.)

**TINCTURA PHYSALIS.**—Dried Berries, 2; Proof Spirit, 8; digest 7 days.

**Dose.**—1 to 2 drs. Diuretic and febrifuge.

# PHYSOSTIGMATIS SEMEN.

## CALABAR BEAN.

*B.P.Syn.*—Physostigmatis Faba.

The dried seed of *Physostigma venenosum.* It yields its virtues to Alcohol, and imperfectly to Water. The cotyledons when moistened with Solution of Potash become a pale yellow.

Considerable discrepancies exist in the published matter regarding the Calabar Bean.

(1.) In 1876 it was stated that the bean contained two alkaloids, Physostigmine and Calabarine, the latter physiologically antagonistic to the former, differing in Ether solubility, &c. This has never been corroborated, and from the experiments of MacEwan (*C.D.* '87, i. 193) does not seem to apply to beans and extract as met with in commerce.

(2.) According to *P.J.*, xv. 594, commercial extracts might contain from 1 to 10·5 per cent. of alkaloid. The probability is that the very low figures are due to the use of a weak spirit in preparing the extract, but some of the higher figures point rather to the use of a variety of bean, *P. cylindrospermum*, of great alkaloidal strength, a quantity of which was imported about 1878, but which has not been seen on the market since.

(3.) From *P.J.* xv. 593, it would appear that although 66 per cent. Alcohol gives an extract of only half the alkaloidal strength of one made with Rectified Spirit, the yield from the former is 3½ times as much as from the latter, so that nearly twice as much alkaloid is extracted. The inference is that if Extractum Physostigmatis is retained in B.P., a weaker alcohol than Rectified Spirit should be used in its preparation ; but perhaps it would be better if the extract were discarded in favour of the crystallised alkaloidal salts.

28 lbs. of Calabar Beans, treated by us, yielded 2·07 per cent. of extract by the B.P. process; this extract yielded 5·74 per cent. of alkaloids, which is equal to nearly ·12 per cent. of alkaloids in the Beans.

The same powder treated with boiling Rectified Spirit in an exhaustion apparatus yielded 4·66 per cent. of extract; which extract yielded 3·2 per cent. of alkaloids, which is equal to nearly ·15 per cent. of alkaloids in the Beans.

**Dose.**—In powder, 1 to 4 grs.

(Belg., Semen Calabariense ; Dutch, Semen Physostigmatis ; Fr., Fève du Calabar ; Port., Fava do Calabar ; Span., Haba del Calabar ; Swed., Semina Calabar ; U.S., Physostigma ; not in the others.).

*Stimulates the liver, but not powerfully unless given in large doses.—Dr. Rutherford.*

**Medicinal Properties.**—Contracts the pupil ; excites muscular spasm, followed by relaxation. Increases most of the secretions, and has been recommended in atony of the bowels. An interesting account of *Traumatic Tetanus* being cured by Calabar Bean, ⅛ gr. of the Extract given every hour, increasing the dose according to symptoms.—*L.* '67, i. 265 ; *L.* '68, i. 434, 463.

### Preparation.

### EXTRACTUM PHYSOSTIGMATIS.

Calabar Bean, in No. 40 powder, 1 ; Rectified Spirit, 5 : macerate the Bean for forty-eight hours in one-fourth of the Spirit in a closed vessel, agitating occasionally, then transfer to a percolator, and when the fluid ceases to pass, add the remainder of the Spirit, so that it may slowly percolate through the powder; subject the residue of the Bean to pressure, adding the pressed liquid to the product of the percolation, filter, distil off most of the Spirit, and evaporate what is left in the retort by a water-bath to the consistence of a soft extract.

*See* also note under "Seeds."

**Dose.**—$\frac{1}{16}$ to $\frac{1}{4}$ gr. three times daily.

(Belg., Fr., Port., Span., Swed. and U.S.; Dutch, with 5 p. c. of Glycerine; not in the others.)

**Not Official.**

**TINCTURA PHYSOSTIGMATIS.**—Calabar Bean, in coarse powder, 1; Rectified Spirit, 5: digest fourteen days.

**Dose.**—10 minims, gradually increasing.

(Fr., 1 and 5; U.S., 15 in 100; not in the others.)

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# PHYSOSTIGMINA.

## PHYSOSTIGMINE.

*B.P.Syn.*—ESERINE.

$C_{15}H_{21}N_3O_2$, eq. 275.

An alkaloid obtained from the alcoholic extract of Calabar Bean by dissolving the extract in Water, adding Bicarbonate of Sodium, shaking the mixture with Ether, and evaporating the ethereal liquid.

It has been shown (*P.J.* xv. 593) that if the extract be prepared with Rectified Spirit as directed in B.P. it is exceedingly difficult to disintegrate the extract in Water, an extract readily miscible with water must have been prepared with a weaker spirit; also (*C.D.* '88, i. 726) that unless the solution be filtered before the addition of Bicarbonate of Sodium, the product is sure to contain Physosterin, a crystalline body similar to Cholesterin.

Colourless or pinkish crystals. The aqueous solution has an alkaline reaction, when warmed with or when shaken with dilute solution of Potash becomes red, and when evaporated to dryness over a water-bath leaves a bluish residue, the acidified solution of which is beautifully dichroic, being blue and red.

This reaction was originally described by Petit (*Y.B.P.* '72, 253), but using Ammonia and not Potash. The Codex gives the test also using Ammonia. Umney (*P.J.* xx. 1061) shows that Potash (ordered in B.P.) is wrong and that nothing but Ammonia will answer the purpose.

The pink colour developed in Physostigmine and its solutions is due to the formation of Rubreserine, a brilliantly-coloured red compound due to oxidation of Physostigmine under the influence of traces of Ammonia absorbed from the atmosphere. Its formation is prevented by presence of a minute quantity of some reducing acid such as Sulphurous or preferably Hypophosphorous Acid.—*C.D.* '89, ii. 559.

A delicate reaction is described *P.J.* xxiv. 182: a minute fragment of Physostigmine, or one of its salts, is dissolved in one or two drops of fuming Nitric Acid, the yellow solution when evaporated to dryness on a water-bath yields a *green* residue, Chloreserine.

**Solubility.**—1 in 350 of Water, 1 in 2 of Rectified Spirit; readily soluble in dilute Acids.

(Fr.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Physostigmine and its salts are used to contract the pupil of the eye.

### Preparation.

**LAMELLÆ PHYSOSTIGMINÆ.**

Discs of Gelatine, with some Glycerine, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{1000}$ gr. of Physostigmine.

(Ital. (Dischi Oftalmici con Eserina); not in the others.)

Books of Calabar Bean Paper and of Calabar Bean Gelatine, with divided squares, are also used by oculists to contract the pupil of the eye (after the use of Belladonna or Atropine), in order to bring back the vision to the normal state.

### Not Official.

**PHYSOSTIGMINÆ HYDROBROMAS.**—In fibrous masses, non-deliquescent, very soluble in Water.

(Fr.; not in the other Pharmacopœias.)

**PHYSOSTIGMINÆ SALICYLAS.**—*Syn.*—ESERINÆ SALICYLAS.

Colourless acicular crystals, becoming coloured on exposure to light and air. Soluble 1 in 130 of Water; 1 in 15 of Rectified Spirit.

(Austr., Dan., Dutch, Ger., Hung., Ital., Russ., Swiss and U.S.; not in the others.)

**PHYSOSTIGMINÆ SULPHAS.**—*Syn.*—ESERINÆ SULPHAS.

An amorphous powder, very deliquescent and very soluble in Water.

(Belg., Fr., Ger., Span., and U.S.; not in the others.)

**GUTTÆ PHYSOSTIGMINÆ** (*L.O.H.*).—Sulphate of Physostigmine, 2 grs.; Water, 1 oz.

**GUTTÆ PHYSOSTIGMINÆ FORTIORES** (*L.O.H.*).—Sulphate of Physostigmine, 4 grs.; Water, 1 oz.

**GUTTÆ PHYSOSTIGMINÆ CUM COCAINA** (*L.O.H.*).—Sulphate of Physostigmine, 1 gr.; Hydrochlorate of Cocaine, 5 grs.; Water, 1 oz.

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### Not Official.

## PHYTOLACCA.

Both the **fruit** (Poke fruit) and the **root** (Poke root) of *Phytolacca decandra* are Official in U.S.

The Fluid Extract has been recommended for inflamed and painful mammæ, internally and as a local application.—*B.M.J.* '87, ii. 844.

It has also been used in orchitis.—*T.G.* '85, 622.

It is emetic, purgative, and slightly narcotic.

### Preparations.

**EXTRACTUM PHYTOLACCÆ RADICIS FLUIDUM** (*U.S.*).—1 fluid ounce is equal to 1 ounce of the Root.

**PHYTOLACCIN.**—An eclectic remedy. Hepatic and alterative, ¼ to ½ grain; purgative, 2 to 4 grains.

*Is a powerful hepatic stimulant; it also slightly stimulates the intestinal glands.—Dr. Rutherford.*

## PICROTOXINUM.

PICROTOXIN.

A neutral principle, prepared from the seeds of *Anamirta paniculata*, (more commonly known as *Cocculus Indicus*), by exhaustion with Alcohol, evaporation and purification.

Colourless and inodorous prismatic crystals, possessing a bitter taste.

**Solubility.**—1 in 334 of Water; 1 in 13½ of Rectified Spirit.

(Fr. and U.S.; not in the others.)

**Tests.**—Melts at 378° F. (192·2° C.). It is soluble in 10 parts of Solution of Potash, and the resulting liquid on boiling immediately reduces Fehling's Solution.

This test may also be applied to a cold saturated solution in Water, 5 c.c. of which will give a distinct reaction. If to this quantity 1 c.c. Pavy's Solution be added, and the liquid boiled, the blue colour will completely disappear.

Heated on a Platinum foil, the crystals melt, forming a yellowish liquid which by further heating chars and is at length completely dissipated. Its aqueous solution is not precipitated by solutions of Perchloride of Mercury, Perchloride of Platinum, or Tannic Acid. It dissolves in Sulphuric Acid with a saffron-yellow colour.

**Medicinal Properties.**—$\frac{1}{60}$ grain has been given as a remedy against immoderate sweating in phthisis.—*B.M.J.* '80, i. 96; *B.M.J.* '85, ii. 610. $\frac{1}{8}$ to $\frac{1}{6}$ grain given in epilepsy.—*L.M.R.* '87, 155.

On account of its bitterness, it has been fraudulently used as a substitute for Hops in Beer, which is the more objectionable because of its poisonous properties.

**B.P.Dose.**—$\frac{1}{100}$ to $\frac{1}{30}$ grain.

**Antidote.**—Chloral and Picrotoxine are mutually antagonistic.

## PILOCARPINÆ NITRAS.

NITRATE OF PILOCARPINE.

$C_{11}H_{16}N_2O_2$, $HNO_3$, eq. 271.

The nitrate of an alkaloid obtained from extract of Jaborandi by shaking it with Chloroform and Alkali, evaporating the chloroformic solution, neutralising the product with Nitric Acid, and purifying by recrystallisation.

A white crystalline powder or in acicular crystals.

**Solubility.**—1 in 8 of Water; 1 in 50 of Rectified Spirit.

**Tests.**—Strong Sulphuric Acid forms with it a yellowish solution. which on the addition of Bichromate of Potassium gradually acquires an emerald-green colour. It leaves no ash when burned with free access of air.

(Span.; not in the others. Fr., has Pilocarpine.)

The **Hydrochlorate of Pilocarpine** is preferred in all other countries, *see* p. 405, and is most frequently prescribed in London.

**Medicinal Properties.**—A powerful diaphoretic and sialagogue. Is useful in the uræmic stage of Bright's disease. It should be used with caution in cases of weak heart. It contracts the pupil of the eye.

**Dose.**—$\frac{1}{20}$ to $\frac{1}{2}$ gr.

$\frac{1}{20}$ grain three times a day given to moisten the mouth in diabetes and diminish thirst.—*L.* '84, ii. 275. A case of convulsions during pregnancy treated by hypodermic injections, $\frac{1}{3}$ grain of Hydrochlorate of Pilocarpine.—*L.* '85, i. 1079; '86, i. 635, 1016. Useful in certain cases of deafness, especially of syphilitic origin, *B.M.J.* '85, i. 1192; '89, i. 471; '89, ii. 220; '90, ii. 86; *L.* '89, ii. 643. On its use in affections of the ear, *L.* '91, i. 10; *B.M.J.* '90, i. 1125, 1300; '90, ii. 1511; '91, i. 49; '93, i. 407; '93, ii. 570. In jaundice, *L.* '89, i. 1157. In uræmia, *B.M.J.* '88, i. 188; as a galactagogue, *L.* '85, ii. 885.

### Not Official.

**GUTTÆ PILOCARPINÆ** (*L.O.H.*).—Nitrate of Pilocarpine, 2 grs.; Distilled Water, 1 oz.

**INJECTIO PILOCARPINÆ NITRATIS** (*L.O.H.*).—Nitrate of Pilocarpine, 1 gr.; Water, 20 mins.

**PILOCARPINÆ HYDROCHLORAS.**—Minute white crystals, deliquescent, neutral. Very soluble in Water and Rectified Spirit.

(Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Russ., Swiss and U.S.; not in the others.)

## PILULÆ.

### PILLS.

This class of medicine, so convenient and portable, was introduced in the earliest Pharmacopœias, and some of them remain unchanged to the present day. We may mention the Pilula Rufi, which has for at least two hundred years maintained practically the same composition, and is now called Pilula Aloes et Myrrhæ.

**Excipients** for pills are of two kinds: (1) those which are more or less fluid, and employed to bind together powders, or to impart the necessary moisture to adhesive substances; (2) those, generally in powder, which are intended to absorb moisture and give solidity to the mass. Of the former, "Dispensing Syrup" (equal volumes of Glycerine, Syrup, and Mucilage) and Glucose, are most in request; Proof Spirit also is very useful. Glycerine by itself is distinctly inferior to the foregoing. Glycerine of Tragacanth is much employed, but in the majority of cases where it would be used, we should prefer Glucose, either by itself or mixed with an equal weight of Syrup. Of the powders, that of Liquorice root is most useful when moisture is to be absorbed and no binding power required. An unexpected exception is the case of Carbolic Acid, which makes a very good plastic mass with twice its weight of Liquorice powder (when well worked together, the result is very satisfactory). When more plasticity is required, the absorbent powder is supplemented with Compound Tragacanth Powder, or powdered Gum Acacia. For Essential Oils this condition is best obtained by the use of powdered Curd Soap; as a rule, one minim of the Oil will require half a grain of the Soap and two grains of the Liquorice. A mixture of Paraffins (Massa Paraffinum), without or with Kaolin (Massa Kaolin), is used for substances which are readily reduced by organic matter, such as the Permanganates, and the salts of Gold and Silver. It "goes without saying" that an excipient must not be chemically incompatible with the other ingredients, but there is not much opportunity for such an occurrence, with those above selected.

**Coatings.**—Pills have been finished in various ways: rolled in Flour, Starch, Magnesia, Liquorice powder, and in Lycopodium, or a mixture of these; enveloped in Silver or Gold Leaf; coated with Ether-Alcoholic solution of Tolu or better of Sandarach (Ether 2, Absolute Alcohol 6, Sandarach 3), or with Gelatine or French Chalk. When pills are intended to pass through the stomach, and to be disintegrated in the intestine, they are coated with a solution of Keratine or of Salol.

The following are contained in the British Pharmacopœia, the formulas for which will be found under the names of the substances from which they are prepared:—

| | Proportions of active ingredient in the mass. |
|---|---|
| PILULA ALOES BARBADENSIS | 1 in 2. |
| PILULA ALOES ET ASAFŒTIDÆ | Aloes 1, Asafœt. 1 in 4. |
| PILULA ALOES ET FERRI | Aloes 1, Iron $\frac{3}{4}$ in $5\frac{1}{4}$. |
| PILULA ALOES ET MYRRHÆ | Aloes 1, Myrrh $\frac{1}{2}$ in 3. |
| PILULA ALOES SOCOTRINÆ | 1 in 2. |
| PILULA ASAFŒTIDÆ COMPOSITA | Asafœt. 1, Galb. 1 in $3\frac{1}{2}$. |
| PILULA CAMBOGIÆ COMPOSITA | about 1 in 6. |
| PILULA COLOCYNTHIDIS COMPOSITA | Col. 1, Aloes 2, Scam. 2 in 6. |
| PILULA COLOCYNTHIDIS ET HYOSCYAMI | Pil. Col. Co. 2<br>Ext. Hyos. 1. in 3. |
| PILULA CONII COMPOSITA | Ext. Con. $2\frac{1}{2}$, Ipec. $\frac{1}{2}$ in 3. |
| PILULA FERRI | Carbonate of Iron about 1 in 5. |
| PILULA FERRI CARBONATIS | Saccharo-Carbonate 1 in $1\frac{1}{4}$. |
| PILULA FERRI IODIDI | Iodide of Iron 1 in $3\frac{1}{2}$. |
| PILULA HYDRARGYRI | Mercury 1 in 3. |
| PILULA HYDRARG. SUBCHLORIDI COMPOSITA | 1 Calomel in 5. |
| PILULA IPECACUANHÆ CUM SCILLA | 3 Dover's Powder in 7. |
| PILULA PHOSPHORI | In 3-gr. Pills, each Pill containing $\frac{1}{30}$ gr. of Phosphorus. |
| PILULA PLUMBI CUM OPIO | Acet. Lead 6, Opium 1 in 8. |
| PILULA RHEI COMPOSITA | Rhubarb 3, Aloes $2\frac{1}{4}$ in 10. |
| PILULA SAPONIS COMPOSITA | 1 Opium in 6 nearly. |
| PILULA SCAMMONII COMPOSITA | Resin Scam. 1, Resin Jalap 1 in $3\frac{1}{4}$. |
| PILULA SCILLÆ COMPOSITA | Squill 1 in 5. |

N.B.—The usual dose of all pills is from 5 to 10 grains, unless otherwise directed.

## PIMENTA.

PIMENTO.

The dried unripe full-grown fruit of *Pimenta officinalis.*

From the West Indies.

(Port., Pimenta da Jamaica; Span., Pimienta de la Jamaica; U.S.; not in the others.)

**Medicinal Properties.**—A warm aromatic stimulant, like Cloves; used as an adjuvant to tonics and purgatives.

**Dose.**—10 to 30 grs. in powder.

### Preparations.

**AQUA PIMENTÆ.**

Pimento, bruised, 7; Water, 160: distil one-half. =(1 in $11\frac{1}{2}$).

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias.)

## OLEUM PIMENTÆ.

The Oil distilled in Britain from Pimento. Sp. g. 1·030—1·050.

**Solubility.**—In all proportions of Rectified Spirit; about 1 in 50 of Proof Spirit.

When shaken with an equal volume of Solution of Ammonia it forms a soft yellow crystalline mass. This also is the case with Oil of Cloves and partially so with Oil of Cinnamon.

1 minim dissolved in 60 minims of Rectified Spirit, and treated with 1 minim of a very dilute solution of Ferric Chloride, turns a fine indigo blue colour. This is also the case with Oil of Cloves, which Oil of Pimento very much resembles in chemical constitution.

**Dose.**—1 to 4 minims, on **sugar**, or in **pill** with Liquorice powder and Soap, p. 405.

(U.S.; not in the other Pharmacopœias.)

Not Official.

## PINI PUMILIONIS OLEUM.

An oil distilled from the fresh leaves and young shoots of *Pinus pumilio*, Mountain Pine.

This is also sold under the names "Pinol" and "Pumiline."

Sp. g. about ·868. All but a small fraction distils between 330° and 350° F.

**Solubility.**—About $\frac{4}{5}$ dissolves 1 in 5 of Rectified Spirit, but the remaining $\frac{1}{5}$ is much less soluble.

(Austr. and Swiss; not in the other Pharmacopœias.)

**Medicinal Properties.**—The vapour is a mild stimulant in chronic catarrhal affections. It is also applied externally in rheumatism. Internally the dose is 1 to 5 minims.

**EXTRACTUM PINI PUMILIONIS.**—A liquid extract, of a brown colour, prepared from the young shoots of the Mountain Pine. It is used in baths.

## PINI SYLVESTRIS OLEUM.

### FIR-WOOL OIL.*

The oil distilled from the fresh leaves of *Pinus sylvestris.*

Colourless, or nearly so, with an agreeable odour.

B.P. sp. g. not below ·870.

Beaver's is generally below ·870.

**Solubility.**—1 in $7\frac{1}{2}$ of Rectified Spirit; in all proportions of Absolute Alcohol.

(Hung., sp. g. ·872; Russ., Oleum Pini Foliorum, sp. g. ·870—·880; not in the others.)

**Medicinal Properties.**—It is used externally in rheumatism, and as an inhalation with hot water in chronic laryngitis.

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* This is a registered Trade Mark.

### Preparation.

**VAPOR OLEI PINI SYLVESTRIS.**

Fir-wool Oil, 40 minims; Light Carbonate of Magnesium, 20 grains; Water a sufficiency: rub the Fir-wool Oil with the Carbonate of Magnesium and gradually add sufficient Water to produce 1 fluid ounce.

Put 1 fluid drachm of this mixture with half a pint of cold Water and half a pint of boiling Water into an apparatus so arranged that air may be made to pass through the solution and may afterwards be inhaled.

## PIPER NIGRUM.

### BLACK PEPPER.

The dried unripe fruit of *Piper nigrum.*

Chiefly from the East Indies.

The ash of genuine Black Pepper varies from 4 to 6 p.c. (*Blyth*).

(Belg.; Fr., Poivre Noir; Port., Pimenta; Span., Pimisuta Nigra; U.S.; not in the others.)

**Medicinal Properties.**—A warm carminative stimulant, producing general arterial excitement. Chiefly used to excite the languid stomach and correct flatulence. Acts on the mucous membrane of the rectum, whence it is useful in hæmorrhoids; also on the membrane of the urethra, similarly to Cubebs. In intermittents it may be used as an adjuvant to more powerful febrifuges, as with drunkards, when the stomach is not acted upon by Quinine.

**Dose.**—5 to 20 grs. in powder.

Contained in Confectio Opii and Pulvis Opii Compositus.

### Preparation.

**CONFECTIO PIPERIS.**

Black Pepper, in fine powder, 2· Caraway fruit, in fine powder, 3; Clarified Honey, 15: triturate. =(1 in 10).

**Dose.**—60 to 120 grs.

(Not in the other Pharmacopœias.)

### Not Official.

**OLEO-RESINA PIPERIS** (*U.S.*)—Obtained from Pepper by exhaustion with Ether, and separation from the Piperine.

**Dose.**—$\frac{1}{4}$ to 1 minim, given in **pill.**

**PIPERINUM** (*U.S.*).—A neutral principle obtained from Piper Nigrum and also from other plants of the natural order Piperaceæ.

It possesses antipyretic properties, but it is not the active principle of Pepper.

**Dose.**—2 to 8 grains.

In intermittent fever.—*B.M.J.* '86, ii. 449, 613.

### Not Official.

## PIPERAZINE.

$C_4H_{10}N_2$, eq. 86.

Colourless deliquescent crystals, readily soluble in Water.

When anhydrous it melts at 104° to 107° C., and boils at 145° C. It has a powerful solvent action on Uric Acid, the Urate of Piperazine being about seven times more soluble than Urate of Lithium. Hence it has been recommended for gouty affections in general, rheumatic arthritis, and renal colic.

Usual dose 5 grains three times a day.

Not Official.

## PISCIDIA.

*Syn.*—Jamaica Dogwood.

The bark of the root of *Piscidia erythrina.*

The shrub is a native of South America and the West Indies, where it has been used for stupefying fish.

**Medicinal Properties.**—Narcotic and Anodyne. Has been used in neuralgia and toothache.—*P.J.* xvi. 1014.

Has been found useful in nervous debility and nervous irritability.—*T.G.* '88, 102.

### Preparation.

**EXTRACTUM PISCIDIÆ LIQUIDUM.**—1 fluid ounce is equal to 1 ounce of the root.

**Dose.**—30 to 120 minims.

## PIX BURGUNDICA.

BURGUNDY PITCH.

A resinous exudation from the stem of the *Pinus Picea* (*Abies excelsa*), melted and strained.

Imported from Germany.

**Solubility.**—Almost entirely dissolves 1 in 20 of Rectified Spirit; the greater part dissolves 1 in 1½ of Glacial Acetic Acid.

(Belg. and U.S., Pix Burgundica; Fr., Poix de Bourgogne; Hung., Resina Pini Burgundica; Ital., Pece di Borgogna; Norw. and Swed., Resina Pini Flava; Port., Pez de Borgonha; Span., Pez de Borgona; Swiss, Resina Pini.; not in Austr., Dan., Dutch, Ger. or Russ.)

It is the Thus or Frankincense of Lond. and Dub. Pharmacopœias, which exudes from the spruce fir, and when melted and strained is called Burgundy Pitch.

### Preparation.

**EMPLASTRUM PICIS.**

Burgundy Pitch, 26; Common Frankincense (Thus Americanum), 13; Resin, 4½; Yellow Wax, 4½; Expressed Oil of Nutmeg, 1; Olive Oil, 2; Water, 2: add the Oils and the Water to the other ingredients, previously melted together; stir, and evaporate to a proper consistence.

**Medicinal Properties.**—Applied to the chest in chronic pulmonary complaints, to the loins in lumbago, to the joints in chronic articular affections, and to other parts to relieve local pain of a rheumatic character. It acts as a counter-irritant.

(U.S., Yellow Wax 3, Olive Oil 1, Burgundy Pitch 16; Belg., Fr., Port., Span. and Swiss, Yellow Wax 1, Burgundy Pitch 3; Dan. (Emplastrum Picis), Pitch 8, Yellow Wax 8, Suet 1, Colophonium 8; Ital. (Empiastro Adesivo), Yellow Wax 3, Burgundy Pitch 7, Diachylon Plaster 40; Swed., Resina Pini Flava 6, Pitch 4, Yellow Wax 2, Venetian Turpentine 1; not in the others.)

Not Official.

## PIX CARBONIS LIQUIDA PRÆPARATA.

PREPARED COAL TAR.

Place commercial coal tar in a shallow vessel and heat for one hour at 120° F., stirring frequently.—*B.P.C.*

(Fr., Goudron de Houille ; not in the other Pharmacopœias.)

### Preparations.

**LIQUOR PICIS CARBONIS** (*B.P.C.*) and **EMULSION DE COALTAR** (Fr.).—Prepared Coal Tar 4; Tincture of Quillaia 20: digest at 120° F. for 2 days, allow to cool, decant or filter.

**LIQUOR CARBONIS DETERGENS.**—An alcoholic solution of Coal Tar, as obtained from the gas-works. It is almost black, smells strongly of Naphthalene, and is of light specific gravity. Used externally in skin diseases diluted about 1 in 20 of Water.

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## PIX LIQUIDA.

TAR.

A bituminous liquid obtained from the wood of *Pinus sylvestris* (known in this country as the Scotch Pine), and other Pines by destructive distillation.

Contains Guaiacol and Creosol; the coal-tar preparation having Phenol and Cresol.

Thick, viscid, and brownish black, with a peculiar odour. Water agitated with it acquires a yellowish tint and an acid reaction.

**Solubility.**—In less than its own bulk of Rectified Spirit or Chloroform, and separates on the addition of Water; soluble 1 in 3 of Solution of Soda B.P.; slightly soluble in Olive Oil or Oil of Turpentine.

(In all the Pharmacopœias; Dan., Norw. and Swed., Pyroleum Pini; Fr., Goudron Végétal, obtained from *Pinus maritima*; Ital., Catrame vegetale; Port., Alcatrao; Span., Brea.)

**Medicinal Properties.**—Similar to Turpentine. May be used internally in chronic catarrhal affections, and complaints of the urinary passages; also for some chronic skin diseases. As an external application in cases of lepra, &c. Is useful in chronic bronchitis, taken internally or inhaled from hot water.

**Dose.**—20 to 60 minims, in **capsules**, or in **pills** with Liquorice powder.

### Preparation.

**UNGUENTUM PICIS LIQUIDÆ.**

Tar (by weight), 5; Yellow Wax, 2: melt together and stir till cold.

This ointment is too hard for use. A proper consistence is obtained by replacing half of the Yellow Wax with Almond Oil (*see* Ung. Picis Molle, p. 411).

(Belg., Tar 1, Lard 4; Dan., Pitch 9, Lard 6, Carbonate of Potassium 3, Water 2; Dutch (Ung. Picis), Pix Solida 3, Resin 3, Yellow Wax 2, Olive Oil 12; Fr. (Pommade de Goudron), and Port., Tar 1, Lard 9; Span., Tar 8, Lard 30; U.S., Tar 4, Yellow Wax 1, Lard 3; not in the others.)

Applied in cases of psoriasis and scald-head. Used to remove tetter and in tinea capitis.

## Not Official.

**UNGUENTUM PICIS MOLLE.**—Tar (by weight), 5; Yellow Wax, 1; Almond Oil, 1: melt together and stir till cold.

**AQUA PICIS** (Tar Water).—Stir a pint of Tar with half a gallon of Water for fifteen minutes, and decant.

**Dose.**—From 1 to 2 pints daily, or may be used as a wash.

(Belg. (Aq. Picis Concentrata), Tar 50, Bicarbonate of Sodium 3, Water 200; and Aqua Picis is made with Aq. Picis Conc. 3, Water 97; Dutch, Tar 1, Water 20; Fr. (Eau de Goudron), Tar 1, Pine Sawdust 3, Water 200; Ger., Tar 1, Pumice 3, Water 10; Dan. and Norw. (Aqua Pyrolei Pini), and Swed. (Infusum P. P.), 1 in 10; Port. (Agua de Alcatrao), 1 in 40; Span. (Agua de Brea), 1 in 24; Swiss, Tar 1, Sawdust 1, Cold Water 10; Russ., Birch Tar 1, Water 30: not in Austr., Hung., Ital. or U.S.)

**CAPSULÆ PICIS.**

**Dose.**—2 capsules, three or four times a day, as a stimulant and diuretic.

**PIGMENTUM PICIS LIQUIDÆ** (*B.S.H.*).—Tar 1; Rectified Spirit 1.

Used as a stimulant in cases of psoriasis and of chronic dry eczema.

Its use in eczema demands caution.

**PILULÆ PICIS.**—Tar and Liquorice Powder, equal weights mixed, and made into five-grain pills.

**Dose.**—2 or 3 pills thrice daily.

They are sometimes made of Black Pitch, and have been taken to relieve hæmorrhoids.

**SYRUPUS PICIS LIQUIDÆ** (*U.S.*).—Mix Tar 15 intimately with about 20 of White Sand, pour on 30 of Water, and stir frequently for 12 hours; pour off the Water and throw it away. Pour boiling Distilled Water 80 upon the residue, stir well and frequently for 15 minutes, add Glycerine 20, and set the vessel aside for 24 hours, occasionally stirring; decant the clear solution and filter. Dissolve Sugar 160 in the filtrate with the aid of a gentle heat; allow the liquid to cool, then strain it, and pass enough Water through the strainer to make the product measure 200: mix thoroughly.

May be prescribed with Syrup of Wild Cherry Bark.—*B.M.J.* '88, i. 463, 569; *M.P.* '89, i. 213.

**BLACK PITCH.**—There are three kinds, Archangel, Swedish, and that obtained from Gas Tar; the latter is without odour. Pitch **pills** are sometimes recommended to increase the size and weight of the body.

## Not Official.

# PLUMBUM.

### LEAD.

### Pb, eq. 207.

Sp. g. 11·3; fuses at about 617° F (325° C). Lead occurs in nature as an Oxide, and as a Sulphide called *Galena;* also in saline combination, forming the native Sulphate, Phosphate, Carbonate, Chromate, Molybdate, Tungstate, and Arseniate of Lead. The native Oxide is rare, but Galena, the ore from which nearly all the Lead of commerce is extracted, is exceedingly abundant.

Lead salts are distinguished when in solution from those of any other metal, by giving white precipitates with soluble Chlorides and Sulphates, insoluble in any dilute acid; yellow precipitates with Chromates and Iodides; a black precipitate with Sulphuretted Hydrogen from an acid solution. All of these precipitates (except the Sulphides) are soluble in excess of hot caustic alkali.

**Incompatibles.**
**Antidotes.** } Are given after Plumbi Subacetatis Liquor.

## PLUMBI ACETAS.

ACETATE OF LEAD.

*N.O.Syn.*—Sugar of Lead.

$Pb(C_2H_3O_2)_2.\ 3H_2O$, eq. 379.

The Official process is to dissolve Oxide of Lead (Litharge) in excess of Acetic Acid, evaporate and crystallise.

In white crystalline masses, slightly efflorescent, having an acetous odour, and a sweet astringent taste.

**Solubility.**—1 in 2 of Water; 6 in 1 of boiling Water; 1 in 20 of Rectified Spirit; 1 in 2 of Glycerine.

**Tests.**—Its solution in Distilled Water is clear, or is only slightly turbid and becomes clear on the addition of Acetic Acid. Its solution in Water slightly reddens Litmus, gives a yellow precipitate with Iodide of Potassium, and is precipitated white by Sulphuric Acid, Acetic Acid being set free. 38 grains dissolved in Water require for complete precipitation 200 grain-measures of the volumetric solution of Oxalic Acid.

Dott has shown (*P.J.* xxi. 475) that in a solution containing practically $\frac{1}{6}$ per cent. of Lead Acetate, and Acid equivalent to 6 per cent. of Hydrochloric Acid (not $\frac{1}{6}$ per cent. as reported in *P.J.*), Sulphuretted Hydrogen Gas will produce no precipitate.

(In all the Pharmacopœias; U.S.; Austr., Ger., and Swiss., Plumbum Aceticum; Hung. and Russ., Plumbum Aceticum Depuratum; Dan., Dutch, Norw., and Swed., Acetas Plumbicus; Belg., Acetas Plumbi; Fr., Acétate Neutre de Plomb; Ital., Acetate Neutro di Piombo; Port., Acetato de Chumbo; Span., Acetato Plumbico.)

**Medicinal Properties.**—In small doses it is sedative and astringent, lessening morbid mucous discharges and hæmorrhages, and even diminishing natural secretions; whence it is useful in chronic diarrhœa and dysentery. Used in phthisis to check expectoration; in bronchitis to abate profuse secretion. Its use requires caution. It is often followed by a small dose of Acetic Acid, as excess of Acid makes it less injurious to the system. Externally, it is sedative, desiccant, and astringent, diminishing profuse discharges of ulcers; used for injection in gonorrhœa.

*In large doses somewhat lessens the secretion of bile, probably by direct action on the liver.—Dr. Rutherford.*

**Dose.**—1 to 4 grs. in **pill**; also **in solution,** with excess of Acetic Acid.

**Incompatibles.**—Sulphuric and Tannic Acids, and their salts; Iodides.

**Antidotes.**—Same as under Plumbi Subacetatis Liquor.

### Preparations.

### PILULA PLUMBI CUM OPIO.

Acetate of Lead, in fine powder, 6; Opium, in fine powder, 1; Confection of Roses, 1: mix.

A four-grain pill contains 3 grs. of Plumbi Acetas and ½ gr. Pulvis Opii.

**Dose.**—3 to 5 grains every three or four hours for hæmorrhage.

(Port., Acetate of Lead, 5; Extract of Opium, 1; Extract of Liquorice, 14; not in the other Pharmacopœias.)

### SUPPOSITORIA PLUMBI COMPOSITA.

Acetate of Lead in powder, 36; Opium in powder, 12; Oil of Theobroma, 132; rub the Acetate of Lead and Opium with 42 of the Oil of Theobroma in a slightly warmed mortar, and add them to the remainder of the Oil of Theobroma previously melted at a low temperature, mix them thoroughly, and pour the mixture while it is fluid into suitable moulds of the capacity of 15 grains.

The above in grains makes 12 suppositories.

Each suppository contains 3 grs. of Acetate of Lead and 1 gr. of Opium.

### UNGUENTUM PLUMBI ACETATIS.

Acetate of Lead, in fine powder, 12 grs.; Benzoated Lard, 1 oz.: mix. =(1 in 37½).

(Austr. and Hung., Acetate of Lead 3, Lard 150, White Wax 50, Water 10; Dan. and Ital., Acetate of Lead 1, Benzoated Lard 9; Norw., Acetate of Lead 1, Olive Oil 14, Yellow Wax 5; not in the others.)

### Not Official.

**LOTIO PLUMBI ACETATIS** (*L.O.H.*).—Acetate of Lead, 2 grs. Diluted Acetic Acid, 2 mins.; Water to 1 oz.

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## PLUMBI CARBONAS.

### CARBONATE OF LEAD.

*N.O.Syn.*—CERUSSA.

A soft, heavy, white powder, which is blackened by Sulphuretted Hydrogen.

As no formula or method of preparation is given in the B.P. this may be assumed to be a pure commercial "White Lead," such as is used for painting. It is a mixed or combined Carbonate and Hydrate of Lead, and is very frequently adulterated with Sulphate of Barium.

**Solubility.**—Insoluble in water; soluble, with effervescence, in Diluted Nitric Acid and Acetic Acid.

**Test.**—Dissolves in Diluted Acetic Acid without leaving any residue, and the solution, when treated with excess of Sulphuretted Hydrogen, boiled, and filtered (all the Sulphide of Lead separated), gives no precipitate with Oxalate of Ammonium—indicating absence of Calcium. The solution in Acetic Acid also gives the reactions detailed under Plumbi Acetas.

(Austr., Hung., and Russ., Plumbum Carbonicum; Belg., Ger., and Swiss, Cerussa; Dan., Norw., and Swed., Hydratocarbonas Plumbicus; Dutch, Carbonas Plumbicus; Fr., Carbonate de Plomb; Port., Alvaiade; Span., Albayalde Cerusa; U.S., Plumbi Carbonas; not in Ital.)

**Medicinal Properties.**—Employed externally as an astringent and sedative, or as an ointment for ulcers and inflamed and excoriated surfaces.

### Preparation.

**UNGUENTUM PLUMBI CARBONATIS.**

Carbonate of Lead, in fine powder, 62 grs. Simple Ointment, 1 oz.: mix thoroughly. =(1 in 8).

(Austr., Hung., Norw., Russ. and Swed., 1 in 3; Belg., 1 in 6¼; Dan., 3½ in 10; Dutch and Port., 1 in 5; Ger., 3 in 10; Span. 10 in 28; U.S., 1 in 10; Fr., Pommade de Carbonate de Plomb, 1 in 6; not in Ital. or Swiss.)

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## PLUMBI IODIDUM.

IODIDE OF LEAD.

$PbI_2$, eq. 461.

Nitrate of Lead, 4; Iodide of Potassium, 4; Distilled Water, a sufficiency: dissolve with heat, the Nitrate of Lead in 30 of Water, and the Iodide of Potassium in 10 of Water; mix the solutions, collect the precipitate on a filter, wash it with Distilled Water, and dry it with a gentle heat.

**Solubility.**—1 in 2000 of Water; 1 in 300 of boiling Water; soluble also in solutions of Acetates, and of Chloride of Ammonium.

(U.S.; Belg., Ioduretum Plumbi; Fr., Iodure de Plomb; Russ. and Swiss, Plumbum Iodatum; Port., Iodato de Chumbo; Span., Ioduro Plumbico; Swed., Iodetum Plumbicum; not in the others.)

**Medicinal Properties.**—Used externally as a resolvent to chronic swellings; also in the form of **Pessaries.**

### Preparations.

**EMPLASTRUM PLUMBI IODIDI.**

Iodide of Lead, 1; Lead Plaster, 8; Resin, 1: add the Iodide of Lead in fine powder to the Plaster and Resin previously melted at as low a temperature as possible, and mix them intimately. =(1 in 10).

**UNGUENTUM PLUMBI IODIDI.**

Iodide of Lead, in fine powder, 1; Simple Ointment, 7: mix thoroughly. =(1 in 8).

(Fr., Port., Swiss and U.S., 1 and 9; Span., 4 and 30; not in the others.)

An ointment of **Iodide of Cadmium** of the same strength has been recommended as a substitute; it is stated not to stain the skin.

### Not Official.

**PESSUS PLUMBI IODIDI ET ATROPIÆ** (*Lond. Hosp.*)—Iodide of Lead, 10 grs., Sulphate of Atropia, $\frac{1}{18}$ gr.; (Gelatine) Basis, 60 grs.

**PESSUS PLUMBI IODIDI ET OPII.**—Iodide of Lead, 5 grs.; Opium in powder, 2 grs.; Oil of Theobroma, 12 grs.

## PLUMBI NITRAS.

NITRATE OF LEAD.

$Pb(NO_3)_2$, eq. 331.

**Solubility.**—1 in 2 of Water; 10 in 9 of boiling Water; sparingly in Rectified Spirit.

(Fr., Span., Swiss and U.S.; not in the others.)

Used only to produce Plumbi Iodidum, for which the Acetate would answer equally well.

## PLUMBI OXIDUM.

*B.P.Syn.*—LITHARGE.

$PbO$, eq. 223.

In heavy scales of a pale brick-red colour.

**Tests.**—Soluble in Diluted Nitric Acid and in Acetic Acid without effervescence. Its solution in Diluted Nitric Acid, when supersaturated with Ammonia and cleared by filtration, does not exhibit a blue colour—indicating absence of Copper.

Absence of Iron is also important; it sometimes contains Iron, and will not then make a white plaster.

Used chiefly for the manufacture of other Lead preparations.

(Austr., Hung., Russ., and Swiss, Plumbum Oxydatum; Belg. and Ger., Lythargyrum; Dan., Norw., and Swed., Oxydum Plumbicum; Dutch, Oxydum Plumbicum Semivitreum; Fr., Oxyde (Proto) de Plomb Fondu; Ital., Protossido di Piombo; Port., Oxydo de Chumbo; Span., Litargirio; U.S., Plumbi Oxidum.)

### Preparation.

**EMPLASTRUM PLUMBI.** *N.O.Syn.*—DIACHYLON PLASTER.

Oxide of Lead, in fine powder, 1; Olive Oil, 2 (by weight); Water, 1: boil all the ingredients together gently by the heat of a steam-bath, and keep them simmering for 4 or 5 hours, stirring constantly until the product acquires the proper consistence for a plaster, adding more Water during the process if necessary.

It is practically an Oleate of Lead with mechanically included Glycerine.

Contained in Emplastra Ferri, Galbani, Hydrargyri, Plumbi Iodidi, Resinæ, and Saponis.

Equal weights of Lead Plaster and Soap Plaster melted together, is an excellent plaster for corns.

(Austr. and Hung. (Empl. Diachylon Simplex), Litharge 1, Lard 2; Belg., Litharge 2, Olive Oil 2, Water 1, Lard 2; Dan., Litharge 5, Olive Oil 10, Water 1; Dutch, Ger., Port. and Russ., Litharge 1, Lard 1, Olive Oil 1, Water *q.s.*; Fr., Litharge 1, Lard 1, Olive Oil 1, Water 2; Ital., Norw., Span. and Swed., Litharge 1, Olive Oil 2, Water *q.s.*; Swiss and U.S. (Empl. Plumbi), Litharge 16, Olive Oil 30, Water *q.s.*)

### Not Official.

**UNG. DIACHYLON. HEBRÆ** (modified by Professor Kaposi).—Simple Lead Plaster, 1; Soft Paraffin, 1: melt with heat.

**DR. PEARSON'S CERATE.**—Lead Plaster 4, Yellow Wax 1, Oil of Almonds 3: melt and mix.

**PLUMBI OLEAS.**—Acetate of Lead, 280 grains; dissolve in Distilled Water, 40 oz.; add slowly Solution of Oleate of Sodium (1 Castile Soap in 20, p. 544), 20 oz.; warm gently, wash by decantation, collect and dry.

Melted with equal parts of Lard or Lard oil to form an **ointment.**

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# PLUMBI SUBACETATIS LIQUOR.

## SOLUTION OF SUBACETATE OF LEAD.

*N.O.Syn.*—LIQUOR PLUMBI DIACETATIS. GOULARD'S EXTRACT.

Subacetate of Lead, $Pb_2O(C_2H_3O_2)_2$, eq. 548; dissolved in water.

A dense, clear, colourless liquid, with alkaline reaction and sweet astringent taste, becoming turbid by exposure to the air.

Acetate of Lead, 5; Oxide of Lead, in powder, 3½; Distilled Water, 20: boil half an hour, constantly stirring; filter, and make up with Distilled Water to 20.

Digestion in the cold for a week answers equally well, if not better, than the half-hour's boiling.

**Tests.**—Sp. g. 1·275. It forms with Mucilage of Gum Acacia an opaque white jelly. Sulphuric Acid in excess gives a white precipitate, Acetic Acid being set free. 284·5 grs. by weight require for perfect precipitation 500 grain-measures of the volumetric solution of Oxalic Acid, corresponding to 24 per cent. of the Subacetate of Lead.

The solution contains more nearly 27 than 24 p.c.

(In all the Pharmacopœias; U.S., sp. g. 1·195; Plumbum Aceticum Basicum Solutum, Austr. and Hung., sp. g. 1·230—1·240, Russ., sp. g. 1·235—1·240; Belg., Subacetas Plumbi Liquidus, sp. g. 1·240; Solutio Subacetatis Plumbici, Norw. and Swed., sp. g. 1·170—1·175; Dan., sp. g. 1·165—1·170; Dutch, Solutio Acetatis Plumbici Basici, sp. g. 1·235—1·240; Fr., Sous-Acétate de Plomb Liquide, sp. g. 1·320; Ger., Liquor Plumbi Subacetici, sp. g. 1·235—1·240; Ital., Acetato Basico di Piombo, sp. g. 1·260; Port., Soluto de Subacetato de Chumbo, sp. g. 1·260; Span., Acetato (sub) Plumbico Liquido, sp. g. not given; Swiss, Plumbum Subaceticum Solutum, sp. g. 1·236—1·240.)

**Medicinal Properties.**—When largely diluted, it is used externally as an astringent and sedative for inflammation arising from sprains, bruises, &c.; applied by means of cloths kept wet. As an astringent **gargle** (½ drm. to 6 oz. Rose Water).

**Incompatibles.**—Hard Water, Mineral Acids, Vegetable Acids, Alkalies, Iodide of Potassium, all astringents, preparations of Opium, Mucilage of Acacia.

**Antidotes.**—Sulphate of Sodium, Epsom Salts, succeeded by emetics, and afterwards by Opium and liberal libations of Milk, or white of Egg mixed with Water.

A course of Iodide of Potassium is useful in eliminating Lead from the system.

*L.* '81, ii. 779, gives an unusual source of Lead poisoning, from shot found in a bottle full of Port wine; an appreciable quantity of Lead was found in solution.

### Preparations.

**GLYCERINUM PLUMBI SUBACETATIS.**

Acetate of Lead, 5; Oxide of Lead in powder, 3½; Glycerine, 20; Distilled Water, 12: mix and boil a quarter of an hour; then filter and evaporate until the Water is dissipated.

(Port., Solution 1, Glycerine 9; not in the other Pharmacopœias.)

**LIQUOR PLUMBI SUBACETATIS DILUTUS.** *N.O.Syn.*—GOULARD WATER.

Solution of Subacetate of Lead, 1; Rectified Spirit, 1; Distilled Water, 78: mix and filter through paper. =(1 in 80).

(Austr. and Hung. (Aqua Goulardi), Solution 2, Alcohol (70°) 5, Water 100, also (Aqua Plumbica), Solution 1, Water 50; Belg. (Aqua Vegeto-Mineralis Goulardi), Solution 2, Alcohol (92°) 3·5, Water 100; Norw. and Swed. (Solutio Subacetatis Plumbici Diluta); Dan. (Aqua Saturnini), Solution 2, Alcohol (60°) 8, Water 90; Dutch (Aqua Plumbi), Solution 1, Water 20; Fr. (Lotion dite de Goulard), Solution 2, Alcohol (60°) 8, Water 90; also (Lotion à l'Acetate de Plomb), Solution 1, Water 50: Ger. (Aqua Plumbi), Solution 1, Water 49; Ital. (Acqua con Acetato Basico di Piombo), Solution 1, Water 50; Port. (Aqua Saturnina Alcoolisada), Solution 2, Alcohol (85°) 8, Water 90; also (Aqua Saturnina), Solution 1, Water 50; Russ. (Aqua Plumbi Spirituosa), Solution 2, Alcohol (70°) 8, Water 90; also (Aqua Plumbi), Solution 1, Water 49; Span. (Agua Vegeto-Mineral), Solution 4, Alcohol (90°) 7, Water 345; Swiss (Aqua Plumbi), Solution 1, Water 49; U.S. (same name as Brit.), Solution 3, Water 100.)

**UNGUENTUM GLYCERINI PLUMBI SUBACETATIS.**

Glycerine of Subacetate of Lead, 1 (by weight); Soft Paraffin, 4; Hard Paraffin, 1⅓: melt the Hard and Soft Paraffins together, then add the Glycerine of Lead and stir till cold. =(1 in 6⅓).

(Belg. (Unguent. Subacetatis Plumbi), 1 in 3; Dutch (Ung. Plumbici Basici), 1 in 2; Fr. (Cérat Saturné), 1 in 10; Ger. and Swiss (Unguentum Plumbi), 1 in 10; Russ. (Ung. Plumbi Acetici), 1 in 12; Swed. (Ung. Subacetatis Plumbici), 3 in 20: U.S. (Ceratum Plumbi Subacetatis), 1 in 5; not in the others.)

### Not Official.

**CREMOR LITHARGYRI.**—Solution of Subacetate of Lead, 1; Cream, 7: mix. Useful as an application in eczema.

**UNGUENTUM PLUMBI TANNICI.**

Ger., Tannic Acid 1, Liquor Plumbi 2, Lard 17.

Hung. and Swiss, Tannic Acid 1, Liquor Plumbi 2, Vaseline 17.

Russ., Tannic Acid 1, Glycerine 2, Liquor Plumbi 6, Ung. Cerei 24.

Span., Tannate of Lead 1, Lard 15.

Swed., freshly precipitated Tannate of Lead 2, Glycerine 1.

**GLYCERINUM TANNATIS PLUMBI.**

Belg., freshly precipitated Tannate of Lead 3, Glycerine of Starch 2.
This preparation is recommended for bed-sores and sore nipples.

## PODOPHYLLI RHIZOMA.

### PODOPHYLLUM RHIZOME.

The dried rhizome and rootlets of *Podophyllum peltatum*.

Imported from North America.

It has been suggested that the root of *Podophyllum Emodi*, growing in Northern India, might also be admitted to the Pharmacopœia. The earlier examination showed it to be about 2½ times as rich in resin as the ordinary variety, the resin being medicinally active in ½ grain doses.—*P.J.* xix. 585.

A second examination showed the resin to be efficacious in $\frac{1}{4}$ grain doses, but questioned its agreement in solubility with B.P.—*P.J.* xxi. 445.

A detailed analysis has since been made showing the percentage of resin to be nearly double that from *P. peltatum*, but that the proportion of active constituent in the resin was little more than half. Its action was also stated to be very uncertain. —*P.J.* xxiii. 207.

(Belg., Dutch, Fr., Ital., Port., Span. and U.S.; not in the others.)

**Medicinal Properties.**—An active cholagogue and purgative. Applicable to cases where brisk purging is required; combined generally with Henbane.

Usually prescribed as Resina Podophylli (Podophyllin).

## Preparations.

### RESINA PODOPHYLLI.

Podophyllum Rhizome, in No. 40 Powder, 1; Rectified Spirit, $3\frac{3}{4}$, or a sufficiency; Distilled Water, a sufficiency: exhaust the Podophyllum by percolation with the Spirit; distil off the greater part of the Spirit; slowly pour the remaining liquid into three times its volume of Water, constantly stirring; let it stand twenty-four hours; collect the Resin which falls, wash on a filter with Distilled Water, and dry in a stove.

B.P. '67 precipitated in Water containing Hydrochloric Acid 1 in 24; U.S. employs 1 in 100; B.P. '85 omitted the acid altogether, but it is generally admitted that a slight acidification is an advantage, particularly to facilitate the "settling" and filtration in the collection of the Resin.

An amorphous powder, varying in colour from pale yellow to deep orange-brown; soluble in Rectified Spirit and in Ammonia; precipitated from the former solution by Water, from the latter by acids. Partly soluble in Ether.

The variations in colour appear to depend upon the heat applied during its preparation; by distilling quickly and drying at a low temperature the lightest tints are obtained. It is difficult to find a commercial sample *perfectly* soluble in cold Rectified Spirit, and many will not give clear solutions even with addition of Ammonia. The insoluble matter, however, should not exceed 10 per cent.

Badly adulterated specimens are frequently detected by a high percentage of ash; it may be as low as $\frac{1}{2}$ per cent. and should not exceed 2 per cent.

More than half the weight of Podophyllin Resin should dissolve in cold Chloroform, the residue being generally reckoned as medicinally inert. If the chloroformic solution be evaporated to small bulk and poured into an excess of Ether another inert body (Podophyllic Acid) is precipitated. If the Ether-chloroform be now added to a large excess of Petroleum Ether there is precipitated a compound called **Podophyllotoxin,** supposed to contain the whole medicinal elements of the resin. For a still further fractionation of Podophyllotoxin, *see P.J.* xii. 217, and *Y.B.P.* '82, 158.

*A very powerful stimulant of the liver, and also of the intestine.—Dr. Rutherford.*

**Dose.**—$\frac{1}{4}$ to 1 grain.

(Belg., Dan., Ger., Hung., Russ., and Swiss, Podophyllinum; Dutch, Norw., Port., and U.S., Resina Podophylli; U.S. has also an Extract and Fluid Extract; Fr., Resine de Podophyllum Peltatum; Ital., Podofillina; Span., Podofilina; not in Austr. or Swed.)

### TINCTURA PODOPHYLLI.

Resin of Podophyllum, 80 grains; Rectified Spirit, 10 oz.: dissolve and filter.

1 fluid drachm equals 1 grain of Podophyllin Resin.

**Dose.**—15 to 60 minims.

(Not in the Foreign Pharmacopœias.)

Not Official.

**TINCTURA PODOPHYLLI AMMONIATA.**—Resin of Podophyllum, 24 grs.; Rectified Spirit, 2 oz.; Solution of Ammonia, 1 oz.: dissolve.

The Resin does not separate on the addition of Water.

Not Official.

## POTASSIUM.

POTASSIUM.

**K**, eq. 39.

Potassium was discovered by Sir Humphrey Davy in 1807. It is a soft metal (sp. g. 0·865), cutting like wax, of a silver-white colour, but tarnishes the instant it is cut, and assumes a leaden colour. It has so great an affinity for Oxygen, that when thrown upon Water it combines with it, evolving heat enough to set the liberated Hydrogen on fire, and a solution of Potash is the result.

Potassium Salts are characterised by the violet colour imparted to a bunsen flame (red through blue glass); in aqueous solution by the formation of crystalline Cream of Tartar on the addition of Tartaric Acid, Acetate of Sodium being also added when the Potassium is combined with a mineral Acid; and by giving a yellow crystalline precipitate with Perchloride of Platinum, if the Potassium be present as Chloride, if not Hydrochloric Acid must be added.

The best general reagent for Potassium Salts is probably a saturated aqueous solution of Picric Acid. With a 1 per cent. solution of Nitrate of Potassium a crystalline precipitate is obtained with a few seconds' shaking. With the use of Tartaric Acid no reaction is obtainable in 4 hours.

The prolonged use of Potassium Salts is apt to cause some depression.

## POTASSA CAUSTICA.

CAUSTIC POTASH.

*B.P.Syn.*—POTASSÆ HYDRAS; POTASSA.

Hydrate of Potassium, **KHO**, eq. 56, containing some impurities.

Prepared by evaporating Solution of Potash in a silver basin till it solidifies on cooling.

This allows the retention of a large and indefinite proportion of water. Commercial samples examined (*P.J.* xxii. 393) showed only 60 to 90 per cent. of Hydrate. We find the general range to be between 78 and 85 per cent.

In hard white pencils or cakes, very deliquescent, powerfully alkaline and corrosive.

Commercial Potash as a rule contains 1 or 2 per cent. of Chloride derived from the Carbonate used in its preparation. When required *pure* it is dissolved in Absolute Alcohol, and the solution evaporated as far as practicable without access of air to avoid absorption of Carbonic Acid. No commercial samples, however, are quite free from Carbonate.

**Solubility.**—2 in 1 of Water; 1 in 3½ of Rectified Spirit; 1 in 3 of Glycerine; 1 in 4 of Proof Spirit (if stronger than this the Alcohol separates).

**Tests.**—Its aqueous solution acidified with Nitric Acid gives only scanty white precipitates with Nitrate of Silver and Chloride of Barium (traces only of Chlorides and Sulphates). 56 grains dissolved in Water leave only a trace of sediment, and require for neutralisation at least 900 grain-measures of the volumetric solution of Oxalic Acid.

The test indicates 90 per cent. KOH, which no commercial samples approach, although such a standard is easy of attainment.—*P.J.* xxiii. 619. *See* p. 419.

(Austr. and Hung., Kalium Hydro-oxydatum; Belg., Potassa Caustica Fusa; Dan., Norw., and Swed., Hydras Kalicus; Fr., Potasse Caustique à la Chaux, also à l'Alcool; Ger. and Russ., Kali Causticum Fusum; Ital., Potassa Caustica; Port., Hydrato de Potassa; Span., Hidrato Potasico, also Potassa Caustica por la Cal; Swiss, Kalium Hydricum; U.S., Potassa; not in Dutch.)

**Medicinal Properties.**—A powerful escharotic. Chiefly employed for making caustic issues. Has been much used for the destruction of tumours and the surface of malignant ulcers.

### Preparation.

**LIQUOR POTASSÆ.** SOLUTION OF POTASH.

Carbonate of Potassium, 16; Slaked Lime, washed, 12; Distilled Water, 160: dissolve the Carbonate of Potassium in the Water, and having heated the solution to the boiling-point in a clean iron vessel, gradually mix with it the washed Slaked Lime, and continue the ebullition for ten minutes with constant stirring; allow the insoluble matter to subside, transfer the supernatant liquid when clear, to a stoppered bottle of green glass by means of a syphon, and add Distilled Water if necessary to make it correspond with the tests of sp. g. and neutralising power.

*Note.*—The washed Lime is obtained from about 13 of Slaked Lime washed with Distilled Water (to free from Chloride), until a little of the washings acidified with Nitric Acid gives no cloudiness with Nitrate of Silver.

It has been suggested to make the Liquor by cold digestion rather than boiling, as being less likely to contaminate the product with Alumina and Silica. After a week's digestion, with occasional shaking, the Carbonate of Potassium is completely decarbonated.

Solution of Potash is more readily prepared by dissolving 2 of solid Caustic Potash in 20 of Distilled Water, and adjusting the solution to the proper sp. g.

1 fluid ounce contains 27 grains (5·84 per cent. by weight) of Hydrate of Potassium.

**Tests.**—Sp. g. 1·058. 1 fluid ounce (462·9 grains by weight) requires for neutralisation 482 grain-measures of the volumetric solution of Oxalic Acid. It does not effervesce when added to an excess of diluted Hydrochloric Acid, and when mixed with an equal volume of Distilled Water, it does not give a precipitate with Solution of Lime or Oxalate of Ammonium—indicating absence of Carbonic Acid and Calcium.

These two tests are incompatible. When freshly made, Solution of Potash B.P. must contain a little Lime in solution. As it absorbs Carbonic Acid the Lime will be thrown out, and it is only at the point when these two impurities exactly balance each other that the solution can conform to the above tests.

When it is treated with an excess of Diluted Nitric Acid and evaporated to dryness, the residue forms, with Water, a nearly clear solution, which may be slightly precipitated with Chloride of Barium (a trace of Sulphates), and Nitrate of Silver (a trace of Chlorides), but is unaffected, or but very slightly affected by Ammonia (a trace of Alumina). When acidulated with Hydrochloric Acid, the solution is unaffected by Sulphuretted Hydrogen (absence of Lead).

(U.S., sp. g. 1·036 (5 p.c.); Belg., Potassa Caustica Soluta, sp. g. 1·330—1·340; Ger., Liquor Kali Caustici, Russ., Kali Causticum Solutum, sp. g. 1·126—1·130 (15 p.c.); Span., Solucion de Potassa Caustica, sp. g. 1·334; Swiss, Kalium Hydricum Solutum, sp. g. 1·33; not in the others.)

**Medicinal Properties.**—Antacid, diuretic, and antilithic. As an antacid in dyspepsia. Useful in many skin diseases dependent upon a morbid condition of the stomach; given as an alterative in inflammation of the serous membrane attended with fibrinous depositions, as in pleuritis and pericarditis; also in periostitis; also in scrofula, syphilis, and chronic rheumatism. Externally as a wash in chronic skin diseases, as a stimulating lotion, and as an escharotic against the bite of rabid or venomous animals.

**Dose.**—15 to 60 minims three times a day in Milk, or Mistura Amygdalæ.

It acts powerfully on all organic matter, converting flannel into a kind of soft jelly after immersion for five or six hours.

Used in the preparation of Mistura Olei Ricini.

**Incompatibles.**—Acids, acidulous salts, metallic salts, the preparations of Ammonium, Belladonna, Henbane, and Stramonium.

**Antidotes.**—Diluted Acetic Acid, Citric Acid, Lemon Juice, or any vegetable acids, fixed oils and demulcents.

### Not Official.

**BRANDISH'S ALKALINE SOLUTION.**—American Pearl-ash, 6 lbs.; freshly prepared Quicklime, 2 lbs.; Wood-ashes, 2 lbs.; Boiling Water, 6 gallons; or 6, 2, 2, and 60 parts: add first the Lime, then the Pearl-ash, and lastly the Wood-ashes to the Boiling Water, stir well together, let it stand twenty-four hours, and decant the clear liquor.

**Dose.**—½ to 2 drms. in Milk. Given for scrofulous tumours.

**POTASSA CUM CALCE (Vienna Paste).**—Caustic Potash and Lime, equal weights: powder and mix; it is made into a paste with Rectified Spirit or Glycerine.

(Same as U.S.; Ital., Potash 5, Lime 6; Russ. (Pasta Caustica) Potassa 3, Lime 1.)

The paste is spread on the part to be cauterised, and is allowed to remain for ten or fifteen minutes, while the surrounding skin is protected by adhesive plaster. It is also used in the treatment of lupus.

Potassa cum Calce **in cylinders**, consisting of two parts of Potassa and 1 of Lime was introduced by Dr. Henry Bennet, and is a suitable form for the use of obstetricians.

# POTASSA SULPHURATA.

## SULPHURATED POTASH.

*B.P.Syn.*—HEPAR SULPHURIS; POTASSII SULPHURETUM.

A mixture of salts of Potassium, of which the chief is Sulphide, prepared by fusing 2 of Carbonate of Potassium (after drying) with 1 of Sublimed Sulphur.

Solid greenish fragments, liver-brown when recently broken, alkaline and acrid to the taste.

It was shown, *Y.B.P.* '70, 442, that when well made this preparation really contains 60 per cent. of Sulphide $K_2S_3$, and about 40 per cent. of Hyposulphite. It is conveniently prepared on a small scale in a Florence flask. A commercial sample examined by us in 1890 yielded 48 per cent. $K_2S_3$.

**Solubility.**—1 in 2 of Water.

**Tests.**—About 50 per cent. of it should be soluble in Rectified Spirit. It forms with Water a yellow solution, which has the odour of Sulphuretted Hydrogen, and evolves it freely when excess of Hydrochloric Acid is dropped into it, Sulphur being at the same time deposited. The acid fluid when boiled and filtered is precipitated yellow by Perchloride of Platinum, and white by Chloride of Barium.

(In all the Pharmacopœias; U.S.; Austr., Ger., Russ. and Swiss, Kalium Sulfuratum; Austr. and Hung. have Kalium Sulfuratum pro Balneo; Belg., Sulphuretum Potassii Officiale; Dan., Norw., and Swed., Hepar Sulphuris; Dutch, Trisulphuretum Kalicum; Fr., Sulfure de Potassium Solide; Ital., Solfuro di Potassio; Port., Potassa Sulfurada; Span., Sulfuro (tri) Potasico.)

**Medicinal Properties.**—Irritant, narcotic, and antiseptic. A good remedy for scabies; used also for other chronic eruptions, especially psoriasis.

A hot bath of Sulphurated Potash relieves the itching of jaundice.—*L.* '85, ii. 1220.

### Preparation.

**UNGUENTUM POTASSÆ SULPHURATÆ.**

Sulphurated Potash, 30 grs.; Hard Paraffin, ¼ oz.; Soft Paraffin, ¾ oz.: triturate the Sulphurated Potash in a glass or porcelain mortar and gradually add the melted mixture of the Paraffins, and rub together until the ointment is perfectly smooth and free from grittiness. =(1 in 15½).

This ointment should be recently prepared.

### Not Official.

**BALNEUM SULPHURETUM.**—Sulphurated Potash, 4 oz.; Water, 30 galls.: dissolve.

Used as a solvent and stimulant in cases of psoriasis, &c.

This is not quite so agreeable as the Baréges waters, which may be made artificially as follows:—Sulphuret of Sodium, Carbonate of Sodium, and Chloride of Sodium, of each 20 grains to one gallon. But a much stronger solution is often used.

## POTASSII ACETAS.

ACETATE OF POTASSIUM.

$KC_2H_3O_2$, eq. 98.

Prepared by saturating Carbonate of Potassium with Acetic Acid, evaporating to dryness, and fusing the product.

White, foliaceous, satiny masses, very deliquescent.

**Solubility.**—2 in 1 of Water; 1 in 1 of Proof Spirit; 1 in 2 of Rectified Spirit.

**Tests.**—Neutral to test-paper. Its aqueous solution is unaffected by Sulphide of Ammonium, gives a crystalline precipitate with Tartaric Acid, disengages Acetic Acid on the addition of Sulphuric Acid, and strikes a deep red colour with a diluted solution of Perchloride of Iron.

It is generally alkaline to test-paper.

(In all the Pharmacopœias except Austr., which contains a *solution*, sp. g. 1·200; Ger., Hung. and Russ., have also a solution, sp. g. 1·176--1·180 (33 p. c.); Swed., has also Liquor, 1 in 20; Swiss, has also Liquor, sp. g. 1·16—1·17.)

**Medicinal Properties.**—Used as a diuretic in dropsy; and as an antilithic in gout. It allays sickness in pregnancy, and quiets irritation of the gastric and mucous membranes. It has been used with great success in acute rheumatism.

Best administered in simple solution, with a little Sugar if desired.

**Dose.**—10 to 60 grs.

Not Official.

## POTASSII BENZOAS.

A crystalline powder.

**Solubility.**—1 in 1½ of Water; 1 in 18 of Rectified Spirit.

(Not in the Foreign Pharmacopœias.)

**Medicinal Properties.**—Useful in cystitis with Lithic Acid diathesis.

**Dose.**—15 to 20 grs.

## POTASSII BICARBONAS.

BICARBONATE OF POTASSIUM.

*B.P.Syn.*—Acid Carbonate of Potassium.

$KHCO_3$, eq. 100.

Obtained by saturating a strong aqueous solution of Carbonate of Potassium with Carbonic Acid Gas and recrystallising the separated salt.

Colourless, right rhombic prisms, not deliquescent, of a saline, feebly alkaline taste.

**Solubility.**—1 in 3·2 of Water. Insoluble in Rectified Spirit.

**Tests.**—50 grains, exposed to a low red heat, leave 34½ grains of a white residue (Carbonate of Potassium), which requires for exact saturation 500 grain-measures of the volumetric solution of Oxalic Acid. 20 grains neutralise 14 grains of Citric Acid or 15 grains of Tartaric Acid. It effervesces on the addition of diluted Hydrochloric Acid, forming a solution which gives a yellow precipitate with Perchloride of Platinum.

(U.S.; Belg., Bi-Carbonas Potassæ; Fr., Carbonate (Bi) de Potasse, Norw. and Swed., Bicarbonas Kalicus; Ger., Russ. and Swiss, Kalium Bicarbonicum; Ital., Bicarbonato di Potassio; Port., Bicarbonato de Potassa; Span., Carbonato (bi) Potasico; not in Austr., Dan., Dutch or Hung.)

**Medicinal Properties.**—Antacid, antilithic, and diuretic. A powerful alterative, from its rendering the blood and urine strongly alkaline. Used in dyspepsia as an antacid, and in urinary affections where there is a deposition of Uric Acid. Highly useful in acute rheumatism and in febrile conditions.

20 grains is prescribed in effervescence with 15 grs. of Citric Acid.

Closely resembles the Carbonate, but without its irritant qualities.

Administered in aërated water or plain bitter infusion.

**Compressed discs** of Bicarbonate of Potassium are convenient.

*Does not excite the liver, unless it be given in large doses.—Dr. Rutherford.*

**Dose.**—10 to 20 grs. as an antacid or antilithic; 60 grs. as a diuretic. In acute rheumatism, 30 to 40 grs. every four hours, freely diluted.

### Preparation.

**LIQUOR POTASSÆ EFFERVESCENS.** *B.P.Syn.*—Potash Water.

Bicarbonate of Potassium, 30 grs.; Water, 20 oz.: dissolve, and filter the solution, then force into it as much pure washed Carbonic Acid gas (obtained by the action of Sulphuric Acid on Chalk) as can be introduced with a pressure of about four atmospheres; bottle it, and secure the corks with wires.

**Tests.**—10 fluid ounces, after being boiled for five minutes, requires for neutralisation 150 grain-measures of the volumetric solution of Oxalic Acid. 5 fluid ounces, evaporated to $\frac{1}{5}$, and 12 grains of Tartaric Acid added, yields a crystalline precipitate, which when dry weighs not less than 12 grains.

**Dose.**—5 to 10 oz.

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## POTASSII BICHROMAS.

### BICHROMATE OF POTASSIUM.

*B.P.Syn.*—Red Chromate of Potassium; Anhydrochromate of Potassium.

$K_2CrO_4$, $CrO_3$, eq. 295.

Large red transparent four-sided tables; anhydrous; fuses below redness; at a higher temperature is decomposed, yielding green Oxide of Chromium and yellow Chromate of Potassium.

**Solubility.**—1 in 10 of Water; 5 in 6 of boiling Water.

**Tests.**—Its aqueous solution gives a yellowish-white precipitate with Chloride of Barium, and a purplish-red precipitate with Nitrate of Silver, both of which are soluble in Diluted Nitric Acid. The aqueous solution digested with Sulphuric Acid and Rectified Spirit acquires an emerald-green colour.

(Fr., Ger., Ital., Port., Russ., Span., Swiss and U.S.; not in the others.)

Used officially to produce Chromic Acid and Valerianate of Sodium.

A powerful irritant poison. Rarely used in medicine, but extensively in the arts.

**Antidotes.**—Stomach pump or emetics, Carbonate of Magnesium or Chalk, albuminous and demulcent drinks.

# POTASSII BROMIDUM.

BROMIDE OF POTASSIUM.

KBr, eq. 119.

According to B.P. it may be obtained by adding to Solution of Potash a slight excess of Bromine, evaporating to dryness the resulting solution of Bromide and Bromate, decomposing the latter by fusion with Charcoal, lixiviating and crystallising.

In colourless cubical crystals, odourless, of a pungent saline taste.

**Solubility.**—10 in 17 of Water; 1 in 1 of boiling Water; 1 in 95 of Rectified Spirit; 1 in 17 of boiling Rectified Spirit.

**Tests.**—When its solution in Water is mixed with a little Chlorine, Chloroform agitated with it, on falling to the bottom, exhibits a red colour. 10 grains require for complete decomposition not less than 838 nor more than 850 grain-measures of the volumetric solution of Nitrate of Silver. An aqueous solution, mixed with Mucilage of Starch, and *a drop* of aqueous solution of Bromine or Chlorine, does not exhibit any blue colour—indicating absence of Iodide. Its solution gives only a slight opacity with Saccharated Solution of Lime (trace of Carbonate), or with solution of Nitrate of Barium (trace of Sulphate), and Diluted Sulphuric Acid causes no immediate yellow coloration (absence of Bromate).

In the above Nitrate of Silver titration, if the figures be calculated into KBr, they would show a percentage of 99·72 to 101·15, as 100 per cent. KBr requires 840·3 grain-measures; the excess over the theoretical figure will be due to KCl which may be present from 0·1 to 6 per cent. This cannot give a definite Chloride figure unless all impurities unaffected by Silver Nitrate are known to be absent. The only interfering impurity, however, which may be expected to be present is Water, so that if B.P. directed the *dried* salt to be used for titration, the percentage of Chloride might be arrived at by subtracting 840·3 from the number of grain-measures used, and dividing the result by 5.

Some English samples of the salt contain less than $\frac{1}{4}$ per cent. of Chloride, but U.S.P. allows as much as 3 per cent., and some American samples contain nearly 6 per cent.

(Austr., Ger., Hung., Russ., and Swiss, Kalium Bromatum; Belg., Bromuretum Potassii; Dan., Dutch, Norw., and Swed., Brometum Kalicum; Fr., Bromure de Potassium; Ital., Bromuro di Potassio; Port., Brometo de Potassio; Span., Bromuro Potasico; U.S., Potassii Bromidum.)

**Medicinal Properties.**—Sedative and hypnotic. Very useful in epilepsy and in convulsions generally. Useful in headache and overworked brain. It exerts a sedative influence on the generative organs. Useful in some forms of mania and nymphomania. Relieves in some cases of whooping-cough and spasmodic asthma, both in children and adults. This salt, as well as the Bromide of Ammonium, is used to produce anæsthesia of the larynx.

**Dose.**—5 to 30 grains.

**Incompatibles.**—Any oxidising agents liable to set free the Bromine, *see* Spiritus Ætheris Nitrosi.

## POTASSII CARBONAS.

### CARBONATE OF POTASSIUM.

*N.O.Syn.*—SUBCARBONATE OF POTASH, SALT OF TARTAR, SALT OF WORMWOOD.

Obtained from commercial Pearl-ash, the product of lixiviation of wood-ashes, by treating the Pearl-ash with its own weight of Distilled Water, and evaporating the solution so formed just to dryness while it is kept briskly agitated.

Carbonate of Potassium, $\mathbf{K_2CO_3}$ (eq. 138) with about 16 per cent. of Water of Crystallisation.

16·4 per cent. of Water corresponds to the formula $K_2CO_3$, $1\frac{1}{2}H_2O$, eq. 165.

A white crystalline powder, alkaline and caustic, very deliquescent.

20 grains of Carbonate of Potassium, neutralise 17 grains of Citric Acid or 18 grains of Tartaric Acid.

**Solubility.**—4 in 3 of Water. Insoluble in Absolute Alcohol.

**Tests.**—Loses about 16 per cent. of its weight when exposed to a red heat. When supersaturated with Nitric Acid and evaporated to dryness, the residue is almost entirely soluble in Water, only a little Silica remaining undissolved; and the solution is precipitated only faintly by Chloride of Barium and Nitrate of Silver (traces of Sulphates and Chlorides). 83 grains require for neutralisation at least 980 grain-measures of the volumetric solution of Oxalic Acid.

This titration figure corresponds to $81\frac{1}{2}$ per cent. $K_2 CO_3$, or $97\frac{1}{2}$ per cent. $K_2 CO_3$, $1\frac{1}{2} H_2O$. The faint turbidity with Nitrate of Silver is seldom if ever attained commercially. Carbonate of Potassium may always be expected to contain 1 to 2 per cent. (at least) of Chloride.

(In all the Pharmacopœias. Austr., Ger., Hung., Russ., and Swiss, Kalium Carbonicum; Belg., Carbonas Potassæ; Dan., Dutch, Norw., and Swed., Carbonas Kalicus; Fr., Carbonate de Potasse Pur; Ital., Carbonato di Potassio; Port., Carbonato de Potassa; Span., Carbonato Potasico; U.S., Potassii Carbonas.)

**Medicinal Properties.**—Antacid and diuretic.

**Dose.**—10 to 30 grs.

Contained in Decoctum Aloes Compositum, Enema Aloes, Liquor Arsenicalis, Mistura Ferri Composita, Pilula Ferri, and Unguentum Potassii Iodidi.

## POTASSII CHLORAS.

### CHLORATE OF POTASSIUM.

$\mathbf{KClO_3}$, eq. 122·5.

Prepared by passing Chlorine into a hot aqueous mixture of Slaked Lime and Chloride of Potassium, and separating the resulting Chlorate of Potassium and Chloride of Calcium by crystallisation of the former less soluble salt.

In colourless, inodorous, rhomboidal, crystalline plates, with a cool saline taste.

**Solubility.**—1 in 16 of cold Water; 1 in 2 of boiling Water; 1 in 1700 of Rectified Spirit; 1 in 152 of Proof Spirit.

**Tests.**—Its solution is not affected by Nitrate of Silver or Oxalate of Ammonium—absence of Chlorides and Calcium. By heat it fuses and gives off an abundance of Oxygen gas, leaving a white residue, which gives the reactions of Chloride of Potassium.

Chlorate of Potassium has caused an explosion when rubbed in a mortar with Sulphur or a Sulphide; also with Tannic Acid, *P.J.* xiii. 1085; also when in compressed tablets with Chloride of Ammonium.—*A.J.P.* '90, 385.

> (Austr., Ger., Hung., Russ., and Swiss, Kalium Chloricum; Belg., Chloras Potassæ; Dan., Dutch, Norw., and Swed., Chloras Kalicus; Fr., Chlorate de Potasse; Ital., Chlorato di Potassio; Port., Chlorato de Potassa; Span., Chlorato Potasico; U.S.)

**Medicinal Properties.**—Stimulant and diuretic; it is eliminated unchanged in the urine. A strong solution, 1 or 2 in 40 of Water, is the best **wash** for the mouth when the gums are spongy and irritable; it relieves the tenderness and induces a firmness of the gums; it is also an excellent **gargle** in diphtheria. A solution of ½ drm. in 4 oz. Water, has been used as an **injection** into the bladder, for vesical catarrh. The powder is applied to aphthæ in the mouth.

**Dose.**—10 to 30 grs.

7 drms. taken by mistake caused death.—*L.* '79, i. 206.

**Incompatibles.**—Charcoal, Sulphur, Iodide of Iron. Hydrochloric Acid causes the evolution of Chlorine; other mineral acids, of various chlorous-smelling oxy-compounds, organic acids the same but much more slowly.

## Preparation.

### TROCHISCI POTASSII CHLORATIS.

Made with Chlorate of Potassium, Sugar, and Gum Acacia. Each lozenge contains 5 grs. of Chlorate of Potassium.

**Dose.**—1 to 6 lozenges.

Lozenges are also made with fruit paste, which, being moist and acid, decompose the Chlorate.

Chlorate of Potassium is supplied in **tablets** or **compressed discs,** also combined with Borax.

> (Belg. (Tabellæ), 1½ grs.; Dutch, 1½ grs.; Fr. (Tablettes), 1½ grs.; Ital. (Pastiglia), 1½ grs.; Port. (Pastilhas), 1½ grs.; Span. (Tabletas), 1½ grs.; Swiss (Pastilli), 1½ grs.; U.S., about 4½ grs. in each lozenge.)

## Not Official.

**GARGARISMA POTASSII CHLORATIS.**—Chlorate of Potassium, 1 drm.; Glycerine, ½ oz.; Water to 6 oz.

**PULVIS POTASSÆ CHLORATIS COMPOSITUS.**—Chlorate of Potassium, 1; Borax, 1; Bicarbonate of Sodium, 1; White Sugar, 2; all in powder: mix. A measured teaspoonful to be dissolved in half a tumbler (5 oz.) of tepid water; half the solution to be injected with a syringe along the floor of each nostril night and morning. After use blow the nose freely.—*Central London Throat Hospital.*

**SODII CHLORAS** (*U.S.*).—Soluble in about its own weight of Water, and in five times its weight of Glycerine.

## POTASSII CITRAS.

CITRATE OF POTASSIUM.

$K_3C_6H_5O_7$, eq. 306.

Prepared by neutralising Citric Acid in solution with Carbonate of Potassium and evaporating to dryness.

A white powder, of saline, feebly acid taste, and deliquescent.

**Solubility.**—10 in 6 of Water, 1 in 2 of Glycerine, 1 in 9 of Proof Spirit, but if more of the salt is added the Spirit separates from the watery solution.

**Tests.**—Its dilute solution mixed with solution of Chloride of Calcium remains nearly clear till it is boiled, when a white precipitate separates, readily and almost entirely soluble in Acetic Acid. 102 grains, heated to redness till gases cease to be evolved, leaves an alkaline residue (Carbonate), which, when treated with Distilled Water, filtered, and well washed, yields a clear solution, requiring for exact neutralisation 1000 grain-measures of the volumetric solution of Oxalic Acid.

The *Chloride of Calcium test* as given in the B.P. is greatly influenced by the conditions under which it is performed. If the Citrate solution is very dilute no precipitate will be obtained, even on boiling. If moderately dilute the precipitate is completely, but with some difficulty, soluble in Acetic Acid. Strong Citrate solutions with a small proportion of Chloride of Calcium do not precipitate at all, and with an excess of reagent give a precipitate on boiling which does not redissolve in Acetic Acid.

The *volumetric test* makes no allowance for impurity or moisture; yet Citrate of Potassium cannot be expected to be quite dry, it always contains a slight excess (about 1 per cent.) of Citric Acid, and must contain all the Chlorine present in the Carbonate of Potassium from which it is made.

(Port. and U.S.; not in the others.)

Various solutions of Citrate of Potassium occur as follows: Belg., Hung., and Russ., Potio Riverii; Dan., Julapium Salinum; Fr., Potion Gazeuse; Norw. and Swed., Liquor Citratis Kalici; Port., Soluto de Citrato de Potassa; U.S., Liquor Potassæ Citratis.

**Medicinal Properties.**—It is a valuable saline febrifuge, increasing the secretion of the kidneys, and is thus eliminated in the urine, rendering it neutral or alkaline. Useful in gout and rheumatism. Given as a drink in scurvy.

**Dose.**—20 to 60 grs. in water.

## POTASSII CYANIDUM.

CYANIDE OF POTASSIUM.

**KCN,** eq. 65.

May be obtained by heating Ferrocyanide of Potassium at a red heat until gas ceases to be evolved, allowing the sediment to subside in the still molten mass, and pouring off the clear fluid. It may be purified, if necessary, by solution in and crystallisation from Spirit.

White opaque deliquescent crystalline masses, having the odour of Hydrocyanic Acid. It is intensely poisonous.

If pure it will be translucent, rather than "opaque."

**Solubility.**—1 in $2\frac{1}{4}$ of water; almost entirely 1 in 100 of Rectified Spirit.

**Tests.**—Its aqueous solution has an alkaline reaction; it gives no precipitate with Ferrocyanide of Potassium. The alcoholic solution gives no precipitate with Chloride of Barium. 10 grains dissolved in 1 oz. of Distilled Water requires about 730 grain-measures of the volumetric solution of Nitrate of Silver to be added before a permanent precipitate begins to form, corresponding to 95 per cent. of real Cyanide of Potassium.

The B.P. process will not yield anything like this percentage, ordinary fused Cyanide only contains about 40 per cent. of real Cyanide, but there is no difficulty in obtaining it from 95 to 99 per cent. This pure Cyanide is not prepared from Ferrocyanide but from the Sulphocyanides found in the Lime used to purify Coal Gas.

(Belg., Fr., Port., Span. and U.S.; not in the others.)

Used in the purification of Bismuth.

It is useful to remove the black stains on the skin caused by Nitrate of Silver.

Entomologists use it with gypsum to make poison bottles for killing insects without injuring the plumage or delicate structure; for this purpose dissolve 1 of the Cyanide, in $1\frac{1}{2}$ of Water, and add 2 of Plaster of Paris. This mixture stirred together and poured whilst liquid into a wide-mouthed bottle, forms a hard floor, which is constantly giving off vapour.

## POTASSII FERROCYANIDUM.

### FERROCYANIDE OF POTASSIUM.

*B.P.Syn.*—Yellow Prussiate of Potash.

$K_4FeC_6N_6, 3H_2O$, eq. 422.

A salt obtained by fusing animal substances, such as cuttings of horns, hoofs, and skins, with Carbonate of Potassium and Iron, in an iron pot, lixiviating the crude product with Water, and purifying the salt by crystallisation.

Large yellow crystals.

**Solubility.**—1 in 4 of water; insoluble in Rectified Spirit.

**Tests.**—Its aqueous solution precipitates deep blue with Persulphate of Iron, brick-red (*or rather chocolate-coloured*) with Sulphate of Copper, and white with Acetate of Lead.

(Belg., Fr., Port., Span., and U.S.; not in the others.)

**Medicinal Properties.**—Useful in nervous and atonic dyspepsia, sick headache, irregular bowels, and want of muscular tone.

**Dose.**—2 grs. three times a day.

Used in the preparation of Diluted Hydrocyanic Acid and Cyanide of Potassium.

# POTASSII IODIDUM.

IODIDE OF POTASSIUM.

**KI**, eq. 166.

May be obtained (B.P.) by adding a slight excess of Iodine to Solution of Potash, evaporating to dryness, calcining with Charcoal and purifying by crystallisation. A mixture of Potassium Iodide and Iodate is first formed, the latter being subsequently decomposed into Iodide by the ignition.

In colourless, generally opaque, cubical crystals. It commonly has a feeble alkaline reaction.

**Solubility.**—4 in 3 of Water; 1 in 10 of Rectified Spirit; 1 in 3 of Glycerine.

**Tests.**—The addition of Tartaric Acid and Mucilage of Starch to its watery solution does not develop a blue colour—absence of Iodate. Solution of Nitrate of Silver added in excess forms a yellowish-white precipitate (Iodide of Silver), which, when agitated with Ammonia, yields by subsidence a clear liquid, in which excess of Nitric Acid causes very little turbidity—absence of Chlorine. Its aqueous solution is only faintly precipitated by the addition of Saccharated Solution of Lime—only a trace of Carbonates. 10 grains requires for complete precipitation about 602 grain-measures of the volumetric solution of Nitrate of Silver.

(Austr., Ger., Hung., Russ., and Swiss, Kalium Iodatum; Belg., Ioduretum Potassii; Dan., Dutch, Norw., and Swed., Iodetum Kalicum; Fr. Iodure de Potassium; Ital., Ioduro di Potassio; Port., Iodeto de Potassio; Span., Ioduro Potasico; U.S.)

**Medicinal Properties.**—It is useful in cases where Iodine is indicated, and being less irritating is much preferred for internal administration. Especially useful in secondary and tertiary syphilis. For secondary symptoms 60 grains in solution may be given in the twenty-four hours. It reduces chronic inflammation and swellings and is useful in bronchocele. May be given with Quinine dissolved by Sulphuric or Phosphoric Acid, but not with Nitro-hydrochloric Acid; the eliminated Chlorine decomposes it, and makes an unsightly mixture. Combined with Nux Vomica the system bears it better. It is useful in the elimination of Lead from the system in cases of Lead poisoning.

*Has no notable effect on biliary secretion.—Dr. Rutherford.*

**Dose.**—2 to 10 grs., increasing the dose. 20 grs. are given three times a day.

It is sometimes prescribed with Tincture of Bark, an ounce of which dissolves 30 grains; also with Fowler's Solution to prevent the rash sometimes produced.

It is better borne when given with Acetate of Potash, or when administered alternately with Iodide of Iron.—*L.* '88, i. 1019.

**Incompatibles.**—Sweet Spirit of Nitre, Subnitrate of Bismuth.

Contained in Linimentum Iodi, Liquor Iodi, Tinctura Iodi, Unguentum Iodi.

## Preparations.

### LINIMENTUM POTASSII IODIDI CUM SAPONE.

Curd Soap, cut small, 2; Iodide of Potassium, 1½; Glycerine, 1; Oil of Lemon, ⅛; Distilled Water, 10: reduce the Soap to fine shreds, and dissolve this in the Water and Glycerine in a porcelain dish over a water-bath; then pour it into a mortar in which the Iodide of Potassium has been previously powdered. Mix briskly and continue the trituration until the mixture is cold: set aside for an hour, then rub well the Oil of Lemon into the cream-like product.

The advantages of this liniment are that it does not stain, nor does it irritate when rubbed on the skin; it is employed in enlargement of the joints, indurated glands, especially the cervical glands.

(Swiss (Opodeldoc Iodatum), Lard or Butter, 50; Alcohol (95 p. c.), 25; Solution of Caustic Soda, 25: saponify and dissolve in Alcohol, 800; Iodide of Sodium, 50; Water, 50; Oil of Lemon, 10. Swiss has also Opodeldoc Iodatum Liquidum.)

### UNGUENTUM POTASSII IODIDI.

Iodide of Potassium, 64 grs.; Carbonate of Potassium, 4 grs.; Distilled Water, 1 drm.; Benzoated Lard, 1 oz.: dissolve the Carbonate and the Iodide in the Water, and mix thoroughly with the Lard. =(1 in 8¾).

(Dan., Dutch, Fr., Ger., Hung., Norw., Port., Russ., Swed. and Swiss, 1 in 10; Ital. and Span., 1 in 9½; U.S., 1 in 8½ with Hyposulphite of Sodium; not in Austr. or Belg.)

### Not Official.

**LINIMENTUM POTASSII IODIDI C. SAPONE** (*B.P.* 1867).—Hard Soap, cut small, 1½; Iodide of Potassium, 1½; Glycerine, 1; Oil of Lemon, ⅛; Water, 10.

"Put the Glycerine, Iodide, and 3 oz. of Water into a clean 20-oz. wide-mouthed bottle; then dissolve the soap (finely shaved) in the 7 oz. of Water in a jar by the heat of a water-bath; strain the solution whilst hot through muslin into the bottle containing the Iodide, etc.; allow to stand for two or three minutes, until the bottom of the soap solution is a little opaque, then mix by agitation; lastly add the Oil of Lemon, shaking briskly, and, after agitating at intervals for two hours or more, a liniment in the form of a soft white jelly will result, and remain so; if it should not, a small addition of Water will generally perfect it."

We have given this formula, which is nearly the same as B. P. 1867, as it has been in use for nearly twenty years, and when made properly gives satisfaction. It forms a semi-transparent liquid jelly.

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## POTASSII NITRAS.

NITRATE OF POTASSIUM.

*N.O.Syn.*—NITRE, SALTPETRE.

$KNO_3$, eq. 101.

Nitrate of Potassium of commerce, purified if necessary by crystallisation from solution in Distilled Water. In white opaque masses or fragments of striated, six-sided prisms, colourless, of a peculiar cool saline taste.

**Solubility.**—1 in 4 of cold Water; 2½ in 1 of boiling Water; sparingly in Rectified Spirit.

**Tests.**—Thrown on the fire it deflagrates; warmed in a test-tube with Sulphuric Acid and Copper wire it evolves ruddy fumes. Its solution, acidulated with Hydrochloric Acid, gives a yellow precipitate with Perchloride of Platinum. Its solution is not affected by Chloride of Barium or Nitrate of Silver—indicating absence of Sulphates and Chlorides.

(In all the Pharmacopœias. Austr., Ger., Hung., Russ. and Swiss, Kalium Nitricum; Belg., Nitras Potassæ; Dan., Dutch, Norw. and Swed., Nitras Kalicus; Fr., Azotate de Potasse; Ital., Nitrato di Potassio; Port., Azotato de Potassa; Span., Nitrato Potasico; U.S., Potassii Nitras.)

**Medicinal Properties.**—Refrigerant, diuretic, and sedative. Useful as a gargle in inflammatory sore throat. It reduces the pulse, and is much used in acute inflammatory diseases. Nitrate of Potassium, 5 grs.; Bicarbonate of Potassium, 20 grs.; taken, during effervescence, with Citric Acid, 15 grs., in a small tumbler of cold Water, is a pleasant cooling draught, and very effectual in lessening febrile excitement.

**Dose.**—5 to 20 grs. as a refrigerant and diuretic; 20 to 30 grs. as a vascular sedative in aneurism.

Not Official.

**SAL PRUNELLA.**—Nitrate of Potassium moulded into small balls.

**CHARTA NITRATA** (Belg., Dan., Fr., Ger., Ital., Port., Russ., Swed., Swiss and U.S.).—Soak porous paper in a saturated solution of Nitre, dry it, roll it up, and burn in a candlestick. Used in asthma.

The paper is sometimes impregnated also with Compound Tincture of Benzoin, Spirit of Camphor, Oil of Cassia, Oil of Cinnamon, Oil of Santal, and Tincture of Sumbul.

**CHARTA NITRATA ET CHLORATA.**—Soak porous paper in a saturated solution of Nitrate of Potassium and Chlorate of Potassium, and dry.

For use in asthma.

## POTASSII PERMANGANAS.

### PERMANGANATE OF POTASSIUM.

$KMnO_4$, eq. 158.

Obtained Officially by heating to dull redness a mixture of Black Oxide of Manganese, Caustic Potash, and Chlorate of Potassium, solution and crystallisation.

In dark purple, slender, prismatic crystals, inodorous, with a taste, sweet and astringent, but disagreeably metallic.

**Solubility.**—1 in 18 of Water; 1 in 3 of boiling Water.

**Tests.**—Entirely soluble in cold Water, producing a rich purple colour. 5 grains dissolved in Water require, for complete decoloration, a solution of 44 grains of Granulated Sulphate of Iron acidulated with 2 fluid drachms of Diluted Sulphuric Acid.

(U.S.; Austr., Kalium Hypermanganicum crystallisatum; Belg., Permanganas Potassæ; Dan., Norw. and Swed., Hypermanganas Kalicus; Dutch, Permanganas Kalicus; Fr., Permanganate de Potasse; Ger., Kalium Permanganicum; Hung., Russ. and Swiss, Kalium Hypermanganicum; Ital., Permanganato di Potassio; Port., Permanganato de Potassa; Span., Permanganato Potasico.)

**Medicinal Properties.**—A powerful antiseptic. Useful internally in amenorrhœa, and in anæmia. Externally, as a caustic and deodoriser, to foul ulcers and cancers. Corrects offensive evacuations. Useful as a wash in ozæna; it corrected fœtid expectorations when Carbolic Acid failed.

**Dose.**—1 to 5 grs., in a **pill** with Massa Paraffinum.

### Preparation.

### LIQUOR POTASSII PERMANGANATIS.

Permanganate of Potassium, 88 grs.; Distilled Water, 20 oz.: dissolve. =(about 1 in 100).

If this needs filtration, Pyroxylin or glass-wool is best for the purpose.

(Half the oxidising power of Condy's Fluid.)

**B.P.Dose.**—2 to 4 drms., but it is not given in solution on account of its disagreeable taste. Diluted with 40 to 80 parts of Water, it is useful as a **gargle** or as a cleansing **wash** for foul ulcers, &c.

(Span., 1 in 50; not in the other Pharmacopœias.)

**Incompatibles.**—Ought never to be put in corked bottles, as it soon becomes decomposed when in contact with any organic substance, animal or vegetable.

## POTASSII SULPHAS.

SULPHATE OF POTASSIUM.

$K_2SO_4$, eq. 174.

In colourless, hard, six-sided prisms, terminated by six-sided pyramids.

**Solubility.**—1 in 10 of cold Water, 1 in 4 of boiling Water. Insoluble in Rectified Spirit.

**Test.**—Its solution is neutral to test-paper, and is not affected by Oxalate of Ammonium—indicating absence of Calcium. The solution, acidulated with Hydrochloric Acid, is precipitated white by Chloride of Barium, and yellow by Perchloride of Platinum.

(U.S.; Belg., Sulphas Potassæ; Dan., Dutch, Norw. and Swed., Sulphas Kalicus; Fr., Sulfate de Potasse; Ger., Hung., Russ. and Swiss, Kalium Sulfuricum; Ital., Solfato di Potassio; Port., Sulfato de Potassa; Span., Sulfato Potasico; not in Austr.)

**Medicinal Properties.**—Mildly cathartic, usually operating without irritation. Generally given in combination with Rhubarb. A useful purgative in jaundice and dyspeptic affections.

*Is an hepatic and intestinal stimulant of considerable power. Its action on the liver is, however, uncertain.—Dr. Rutherford.*

**Dose.**—10 to 20 grs. as an alterative; 60 grs. as a purgative.

Contained in Pilula Colocynthidis Composita, Pilula Colocynthidis et Hyoscyami, Pilula Ipecacuanhæ cum Scilla and Pulvis Ipecacuanhæ Compositus.

Sulphate of Potassium was long known as **Sal Polychrestum**, and the Bisulphate (the residue from making Nitric Acid) is called **Sal Enixum.**

## POTASSII TARTRAS.

### TARTRATE OF POTASSIUM.

*N.O.Syn.*—SOLUBLE TARTAR.

$K_2C_4H_4O_6$, $H_2O$, eq. 244.

Obtained in solution by neutralising Acid Tartrate of Potassium with Carbonate of Potassium, evaporating and crystallising.

In small, colourless, four or six-sided prisms.

**Solubility.**—10 in 6 of Water. Insoluble in Rectified Spirit.

**Tests.**—Entirely dissolved by its own weight of Water. 122 grains, heated to redness till gases cease to be evolved, leaves an alkaline residue (Carbonate), which, when treated with Distilled Water, filtered, and well washed, yields a clear solution, requiring for exact neutralisation 990 grain-measures of the volumetric solution of Oxalic Acid.

(Belg., Tartras Potassæ; Dan., Norw. and Swed., Tartras Kalicus; Fr., Tartrate de Potasse Neutre; Ger., Hung., Russ. and Swiss, Kalium Tartaricum; Ital., Tartrato Neutro di Potassio; Port., Tartarato de Potassa; Span., Tartarato Potasico; not in Austr., Dutch or U.S.)

**Medicinal Properties.**—A mild, cooling purgative, operating, like most of the neutral salts, without much pain, and producing watery stools. In smaller doses, diuretic and alterative.

**Dose.**—60 grs. to ½ oz.

## POTASSII TARTRAS ACIDA.

### ACID TARTRATE OF POTASSIUM.

*B.P.Syn.*—POTASSÆ BITARTRAS; CREAM OF TARTAR.

$KHC_4H_4O_6$, eq. 188.

An acid salt obtained from the crude Tartar which is deposited during the fermentation of grape juice and from the lees of wine.

A fine gritty white powder, or fragments of cakes crystallised on one surface, of a pleasant acid taste.

**Solubility.**—1 in 200 of cold Water, 1 in 16 of boiling Water. Insoluble in Rectified Spirit.

**Tests.**—Dried on a water-bath, 204 grains, heated to redness till gas ceases to be evolved, leaves an alkaline residue (Carbonate), which, when treated with Distilled Water, filtered, and well washed, yields a clear solution requiring for exact neutralisation at least 1000 grain-measures of the volumetric solution of Oxalic Acid. When incinerated it leaves a black residue, which, when dissolved in diluted Hydrochloric Acid and filtered, and then neutralised by Ammonia, is usually rendered somewhat turbid by Oxalic Acid.

Tartrate of Calcium is a general impurity, 2 or 3 per cent. being found even in good samples, and to this extent cannot be considered an adulteration. But as noted *C.D.* '93, i. 258, Cream of Tartar can now be readily obtained of 99 per cent.

Some time ago samples were rather frequently met with containing Sulphate of Barium.—*P.J.*, viii. 350, 467, 595.

(In all the Pharmacopœias. Austr. and Hung., Kalium hydro-tartaricum ; Belg., Bitartras Potassæ depuratus ; Dan., Norw. and Swed., Bitartras Kalicus ; Dutch, Tartras Kalicus Acidus ; Fr., Tartrate de Potasse Acide ; Ger. and Swiss, Tartarus depuratus; Ital., Tartrato Acido di Potassio ; Port., Bitartrato de Potassa ; Russ., Kali Bitartaricum depuratum and Purum; Span., Cremor Tartaro; U.S., Potassii Bitartras).

**Medicinal Properties.**—Cathartic, diuretic, and refrigerant. Much used in febrile and dropsical affections.

**B.P.Dose.**—20 to 60 grs.

As a refrigerant or diuretic, 20 to 60 grs.; as an aperient, 60 to 120 grs.; as a hydragogue cathartic, ½ to 1 oz.

Contained in Confectio Sulphuris, Pulvis Jalapæ Compositus, and Trochisci Sulphuris.

Not Official.

**TARTARUS BORAXATUS. TARTRATE BORICO-POTASSIQUE. SOLUBLE CREAM OF TARTAR.**—Soluble Cream of Tartar is a white amorphous powder soluble in its own weight of water. The proportions are :—

Belg., Dan., Fr., Norw. and Swed., Bitartrate of Potassium 2, Borax 1; Dutch, Ger., Swiss. and Russ., Bitartrate of Potassium 5, Borax 2; Span., Bitartrate of Potassium 4, Boric Acid 1 ; dissolve the Borax and Bitartrate in water by the aid of heat, and evaporate to dryness. Port., with Boric Acid and Bitartrate of Potassium, but no quantities given.

**Medicinal Properties.**—Same as Cream of Tartar.

## PRUNUM.

PRUNE.

The dried drupe of the plum, *Prunus domestica.*
Imported from the South of France.

(Belg., Pulpa Prunorum ; Fr., Prunier Commun ; Port., Ameixas Passadas ; Span., Ciruelo ; U.S. ; not in the others.)

**Medicinal Properties.**—Nutritious and refrigerant. Rarely prescribed, though often used in domestic medicine as a laxative.

Contained in Confectio Sennæ.

Not Official.

## PRUNI VIRGINIANÆ CORTEX.

WILD CHERRY BARK.

The bark of *Prunus serotina,* collected in autumn.

In addition to Astringent Tannins, this bark contains **Amygdaline** and **Emulsin,** which on treatment with water develop Hydrocyanic Acid (in a similar manner to the Cherry-Laurel), to which the sedative effect of its preparations are probably due.

(U.S. ; not in the others ; U.S. has also an **Infusion** and **Fluid Extract.**)

Preparations.

**SYRUPUS PRUNI VIRGINIANÆ.**—Wild Cherry Bark in powder, 5; Cold Water, 16 ; infuse 4 hours, then percolate to make 16 ; add Sugar, 28, and shake till dissolved.

Tonic and calming, highly useful in debility of stomach with local irritation.

Extremely useful given in full doses for spasmodic cough with irritable throat. It is also useful as a vehicle for nauseous medicines.

**Dose.**—2 to 4 drms.

**SYRUPUS PRUNI VIRGINIANÆ** (*B.P.C.*).—Wild Cherry Bark, in No. 20 powder, 3 oz.; moisten with Distilled Water and macerate for 24 hours, then pack in a percolator and pour on Distilled Water till 9 oz. of percolate are obtained; in this dissolve 15 oz. Sugar without heat, add 1¼ oz. Glycerine, strain and make to 20 oz.

**Dose.**—½ to 2 drms.

(U.S., Wild Cherry 15, Sugar 70, Glycerine 15, Water to make 100.)

**TINCTURA PRUNI VIRGINIANÆ** (*B.P.C.*).—Wild Cherry Bark, in No. 20 powder, 4 oz.; Distilled Water, 7½ oz.; macerate for 24 hours in a closed vessel and add Rectified Spirit 12½ oz.: macerate for seven days, then press, filter, and add Proof Spirit to make 20 oz.

**Dose.**—20 to 60 minims.

## PTEROCARPI LIGNUM.

RED SANDAL-WOOD.

*B.P.Syn.*—Red Sanders-Wood.

The sliced or rasped heart-wood of *Pterocarpus santalinus.*

From Madras and Ceylon. Used solely as a colouring agent.

(Austr., Belg., Dan. and Swed., Lignum Santali Rubrum; Dutch, Lignum Santalinum; Fr., Santal Rouge; Port., Sandalo Rubro; Span., Sandalo Rojo; U.S., Santalum Rubrum; not in Ger., Hung., Ital., Norw., Russ. or Swiss.)

Contained in Tinctura Lavandulæ Comp.

Not Official.

## PULSATILLA.

The herb of *Anemone Pulsatilla* and *Anemone pratensis* collected soon after flowering. It should be carefully preserved and not kept longer than one year.

(Fr., Span. and U.S.; not in the others).

### Preparation.

**TINCTURA PULSATILLÆ.**—Carefully dried Herb. 1; Proof Spirit to percolate, 10. Unless the herb is very finely powdered, it answers better to soak it in warm Water for a day and then add Alcohol to bring the mixture to the strength of Proof Spirit.

**Medicinal Properties.**—Has been recommended in orchitis and epididymitis, but in experiments at the Lock Hospital it was found to be valueless.—*L.* '89, ii. 216.

**Dose.**—5 to 30 minims.

## PULVERES.

POWDERS.

The following Powders are contained in the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared:—

| | Proportions of active ingredients in the whole. |
|---|---|
| PULVIS AMYGDALÆ COMPOSITUS . . . . . . . | 8 in 13. |
| PULVIS ANTIMONIALIS . . . . . . . . . . . | Oxide 1 in 3. |

| | Proportions of active ingredients in the whole. |
|---|---|
| PULVIS CATECHU COMPOSITUS | 1 in 2½. |
| PULVIS CINNAMOMI COMPOSITUS | 1 in 3. |
| PULVIS CRETÆ AROMATICUS | about 1 in 4. |
| PULVIS CRETÆ AROMATICUS CUM OPIO | Opium 1 in 40. |
| PULVIS ELATERINI COMPOSITUS | 1 in 40. |
| PULVIS GLYCYRRHIZÆ COMPOSITUS | Senna 1 in 6. |
| PULVIS IPECACUANHÆ COMPOSITUS | Opium 1 in 10. |
| PULVIS JALAPÆ COMPOSITUS | 1 in 3. |
| PULVIS KINO COMPOSITUS | Opium 1 in 20. |
| PULVIS OPII COMPOSITUS | Opium 1 in 10. |
| PULVIS RHEI COMPOSITUS | 1 in 4½. |
| PULVIS SCAMMONII COMPOSITUS | 1 in 2. |
| PULVIS SODÆ TARTARATÆ EFFERVESCENS | |
| PULVIS TRAGACANTHÆ COMPOSITUS | 1 in 6. |

## PYRETHRI RADIX.

### PELLITORY ROOT.

The dried root of *Anacyclus Pyrethrum.*

Collected chiefly in Algeria.

(Austr., Belg., Fr. (Pyrethre Officinal), Port. (Pyrethro), Span. (Pelitre), and U.S., same as Brit.; Dan. and Swed., use the root of *Anacyclus officinarum*; not in the others.)

**Medicinal Properties.**—It is powerfully stimulant to the salivary glands, causing a copious flow of saliva, and, on that account, has been used in cases of paralysis of the tongue.

### Preparation.

**TINCTURA PYRETHRI.**

Pellitory Root, in No. 40 Powder, 4; Rectified Spirit, 20: macerate for forty-eight hours with 15 of the Spirit, agitating occasionally, then pack in a percolator, let it drain, and pour on the remaining Spirit; when it ceases to drop, press, filter, and make up with Rectified Spirit to 20. =(1 in 5).

Used on cotton wool for relieving toothache, or when diluted as a mouth-wash.

(Belg., Dan., Fr. and Span., 1 and 5 (by weight); U.S., 1 in 5; not in the others.)

### Not Official.

**TROCHISCI PYRETHRI** (*T. H.*)—Contain one grain in each.

### Not Official.

## PYRETHRI FLORES.

*Syn.*—Insect Powder.

The powder of the flower-heads, obtained in the Caucasus, from *Pyrethrum roseum* and *P. carneum*, and in Dalmatia from *Pyrethrum cinerariæfolium.*

The active principle is an Ether-soluble Resin, not a volatile Oil.—*C. D.* '90, ii. 285.

(Fr.; not in the other Pharmacopœias.)

Keeps away fleas; it also drives away ants if placed in their track.

### Preparation.

**TINCTURA PYRETHRI FLORUM.**—The flower heads, in powder, 1: Proof Spirit to percolate 4.

Diluted 1 to 10 of Water forms a **lotion** to keep away insects.

### Not Official.

## PYRIDIN.

### $C_5H_5N$, eq. 79.

A colourless, volatile, liquid alkaloid obtained from the products of the destructive distillation of bones.

It has a powerful and a peculiar odour. Its aqueous solution gives a strong alkaline reaction to Litmus, but is best titrated by Methyl-orange. It has no action on Phenol-phthalein.

Sp. g. ·980. Boils about 116° C.

Commercially it always contains Picoline. In its cruder forms it is employed in Germany for "denaturating" Alcohol, corresponding to "Methylating" in this country.

It is miscible with Water, Rectified Spirit, Ether, and the fixed Oils.

It yields a crystalline but deliquescent salt with Hydrochloric Acid.

**Tests.**—Added to a solution of Sulphate of Copper, it gives a bluish-green precipitate, soluble in excess to a dark blue liquid, similar to that produced by Ammonia.

It should not redden Phenol-phthalein (absence of Ammonia), should have little or no action on Permanganate of Potassium. A solution of Pyridine ($\frac{1}{2}$ p. c.) should give a crystalline precipitate, becoming almost semi-solid with an equal volume of saturated solution of Picric Acid.

**Medicinal Properties.**—Useful in the treatment of Asthma; 4 or 5 grammes (62 to 77 grains) are allowed to evaporate from a flat dish in a small room, the patient being exposed to its vapour for $1\frac{1}{2}$ hours three times a day.—*B.M.J.* '85, ii. 1074.

Is most beneficial in cardiac dyspnœa, emphysema and angina pectoris.—*L.* '88, i. 437; '88, ii. 438.

If the vapour be inhaled in quantity, it produces headache.

Like Nicotine, it is a good insecticide.

### Not Official.

## PYRODIN.

An impure Acetylphenylhydrazine.

A white crystalline powder, soluble 1 in 50 of Water. Derived from Coal Tar.

**Medicinal Properties.**—A powerful antipyretic. It has been given in doses of 8 to 12 grains once in the 24 hours, but great caution must be exercised, as toxic effects have been produced.—*L.* '88, ii. 1149, 1195; *B.M.J.* '88, ii. 1470.

2 grains per diem given as a maximum dose, lest toxic symptoms should arise.—*Y.B.T.* '90, 311.

## PYROXYLIN.

### PYROXYLIN.

*N.O.Syn.*—Gossypium Fulminans. Lana Collodii. Colloxylinum.

Pyroxylin is Dinitrocellulose $C_6H_8(NO_2)_2O_5$. Gun Cotton is Trinitrocellulose $C_6H_7(NO_2)_3O_5$ and is not soluble in any mixture of Alcohol and Ether.

Cotton Wool, 1; Sulphuric Acid, 5; Nitric Acid, 5: mix the Acids, immerse the Cotton, and stir with a glass rod for three minutes, or until it is thoroughly wetted; then remove it, and thoroughly wash out the acid, so that the washings cease to precipitate with Chloride of Barium. Drain on filtering-paper, and dry in a water-bath.

**Tests.**—Readily soluble in a mixture of Ether and Rectified Spirit. Leaves no residue when exploded by heat.

It is also soluble in Acetone, which might be used as a cheap and effective solvent for making Collodion, it forms a 10 p. c. solution very easily.

It sometimes decomposes on keeping, with disengagement of Nitrous fumes and becomes insoluble.

Belg. (Pyroxylum); no formula given.

Dutch, Ger., Ital. (Cotone Collodio), Russ. and Swiss, Purified Cotton 55, Crude Nitric Acid (sp. g. 1·380) 400, Crude Sulphuric Acid (sp. g. 1·830) 1000.

Fr. (Fulmicoton). Cotton Wool 11, Nitric Acid 100, Sulphuric Acid 200.

Norw., Cotton 1, Nitre 20, Crude Sulphuric Acid 30.

Port. (Algodao Polvora), and Span. (Pyroxilina), Cotton 1, Nitre 20, Pure Sulphuric Acid (sp. g. 1·84) 30.

Swed., Cotton 1, Crude Nitric Acid (sp. g. 1·382—1·390) 9, Crude Sulphuric Acid (sp. g. 1·833) 18.

U.S. (Pyroxylinum). Cotton 1, Nitric Acid 14, Sulphuric Acid 22.

(All by weight except U.S. Not in Austr., Dan. or Hung.)

Used in the preparation of Collodium, Collodium Vesicans.

### Not Official.

**CELLOIDIN.**—Sold in cakes or shavings. When dissolved in a mixture of Alcohol and Ether it is used for imbedding histological specimens previous to cutting sections.

**PHOTOXYLIN.**—A nitrated wood pulp prepared in St. Petersburg. When made into Collodion it is stated to give a tougher film than Pyroxylin on evaporation.—*L.* '87, i. 1253; *B.M.J.* '88, i. 555.

## QUASSIÆ LIGNUM.

### QUASSIA WOOD.

The wood of *Picræna excelsa*, in raspings, shavings, or chips.

From Jamaica.

(U.S., same as Brit.; Austr., Belg., Dan., Norw., Span., and Swed., use *Quassia amara;* Dutch, Fr., Ger., Ital., Port., Russ. and Swiss, use both; not in Hung.)

**Medicinal Properties.**—Possesses in a high degree the properties of the simple bitters, without astringency. Particularly adapted to dyspepsia and in the debility which succeeds acute disease, also as a tonic in intermittents.

A few chips of Quassia or a weak infusion used in the morning bath is a protection against the annoying insects found in our cornfields.—*L.* '84, ii. 306.

### Preparations.

**EXTRACTUM QUASSIÆ.**

Quassia Wood, rasped, 16; Distilled Water, a sufficiency: macerate the Quassia in 8 of Water for twelve hours, pack in a percolator, add

Water till the Quassia is exhausted; evaporate the liquor, filter before it becomes too thick, again evaporate by a water-bath to a proper consistence for forming pills.

48 oz. of wood yield 1 oz. of extract.

**Dose.**—3 to 5 grs.

(Fr. (Quassia Amara), Belg., Ital., Port., and Span., use cold Water; Austr., Dan., Dutch, and Swiss, use boiling Water; U.S., with cold Water, also **Fluid Extract**; Dan. has also a **Fluid Extract**; not in the others.)

### INFUSUM QUASSIÆ.

Quassia Wood, in chips, 55 grs.; cold Distilled Water, 10 oz.: infuse half an hour, and strain. =(about 1 in 80).

**Dose.**—1 to 2 oz.

(Fr., 1 in 200 Quassia Amara; Span. (Tinct. Acuosa de Quassia Amarga) 1 in 100; not in the others.)

A good vehicle for iron preparations.

### TINCTURA QUASSIÆ.

Quassia Wood, in chips, $\frac{3}{4}$; Proof Spirit, 20: digest seven days, agitating occasionally, filter, and make up with Proof Spirit to 20. =(1 in 27).

**Dose.**—$\frac{1}{2}$ to 2 drms.

(Belg., Dutch and Fr., 1 and 5 (by weight); U.S., 1 in 10; not in the others.)

Not Official.

### QUEBRACHO.

The bark of *Aspidosperma Quebracho*, obtained from Chili (*Quebracho blanco.*)

(Austr., Ital. and Swiss; not in the others.)

**Medicinal Properties.**—It is said to possess tonic, febrifuge, and anti-asthmatic properties. Was used rather extensively at one time as a remedy for asthma, but is now seldom prescribed.

A **Tincture** is made 1 in 5 of Proof Spirit; also Official in Swiss.

The following alkaloids and salts can be obtained:—Aspidospermin Cryst. and Sulphate (Fraude); Aspidosamin and Hydrochlorate (Hesse); Quebrachin Cryst. and Hydrochlorate (Hesse), Dose, $\frac{3}{4}$ to $1\frac{1}{2}$ grains; Quebrachamin and Sulphate (Hesse); Hypoquebrachin and Hydrochlorate (Hesse).

Of the alkaloids Quebrachin is more active and more poisonous than Aspidospermine: it has greater antithermic properties.—*L.* '86, i. 804.

## QUERCÛS CORTEX.

OAK BARK.

The dried bark of the small branches and young stems of *Quercus robur*, collected in spring from trees growing in Britain.

(In all the Pharmacopœias except Dutch; Fr. (Chêne), Ital. (Quercia), Port. (Corvalho), Span. (Encina), U.S. (Quercus alba.)

**Medicinal Properties.**—A valuable astringent, whether administered internally or applied externally. May be used either generally or topically, in all cases requiring astringents, such as tenderness of the gums; in leucorrhœa, prolapsus, &c.

**Dose.**—Of the powder, 30 to 120 grs.

### Preparation.

**DECOCTUM QUERCÛS.**

Oak Bark, bruised, $1\frac{1}{4}$; Distilled Water, 20: boil ten minutes in a covered vessel, and strain; wash the marc with Water to make 20.

**Dose.**—1 to 2 oz. two or three times daily. =(1 in 16).

(Russ., Dec. Quercus Aluminatum, 1 in 14; not in the other Pharmacopœias.)

**Incompatibles.**—Mineral Acids, Alkalies, Metallic Salts, Gelatine, Alkaloids.

Not Official.

## QUILLAIA.

*Syn.*—PANAMA WOOD. SOAP BARK.

The inner bark of the tree, *Quillaia saponaria;* it imparts a soapy character to cold Water when macerated in it, and has been much used to diffuse oily liquids, and as a wash for cleansing the hair.

The powder is excessively irritating to the air passages.

It has been found to possess properties allied to Senega, but it contains the two glucosides "Quillaic Acid" and "Sapotoxin" in much greater quantity than they exist in Senega.

(Fr. (Bois de Panama), Ger. (Quillaia), Russ. and U.S. (Quillaja); not in the others.)

**Medicinal Properties.**—Has been strongly recommended as an expectorant, but it is contra-indicated in ulcerations of the throat and alimentary canal, since it is too powerful an irritant.—*Pr.* xxxvi. 29.

### Preparation.

**TINCTURA QUILLAIÆ.**—Bark, 1; Proof Spirit, to percolate, 5.

(Fr. (Teinture de Panama), 1 in 5 (Alcohol 80 p. c.); U.S., 1 in 5 (Diluted Alcohol); *B.P.C.*, 1 in 10 (Rectified Spirit).)

The Rectified Spirit Tincture of the *B.P.C.* is only intended for making Liquor Picis Carbonis and really only forms part of the formula for this latter preparation. For all other purposes a Proof Spirit Tincture is acknowledged to be the best.

Not Official.

## QUININA.

$C_{20}H_{24}N_2O_2$, $3H_2O$, eq. 378.

This alkaloid is precipitated from solutions of its salts as a Trihydrate, containing 14 p. c. of Water. It is met with as a white, soft, granular powder, slightly damp from adherent moisture, easily soluble in Ether or dilute Hydrochloric Acid, and melting to a gummy-looking mass at about 140° F.

When separated from its solutions by shaking out with Ether or Chloroform and evaporating to dryness, it still retains a little Water, dried off with difficulty in a water-bath. For estimation purposes it should be heated to 250° F. (120° C.) before weighing.

Quinine in the free state may be titrated with $\frac{N}{10}$ Sulphuric Acid and Methyl-Orange, and as the alkaloid has no action on Phenol-phthalein, the acid in its salts may be estimated by $\frac{N}{10}$ Soda with that indicator.

The Official salts of Quinine, Hydrochlorate and Sulphate are given under separate headings.

(Austr., Dutch, Fr., Hung., Ital., Port., Russ., Span., Swed., Swiss and U.S.; not in the others.)

**Solubility.**—Very sparingly in Water; 1 in 1 of Rectified Spirit; 1 in 3 of Chloroform; 1 in 4 of Ether.

**Injectio Quininæ Hypodermica.**—Quinine Hydrate, 76 grs.; Lactic Acid, 27 mins., or a sufficiency; Distilled Water, a sufficiency; rub the Quinine with 6 drms. of the Water, and add the Lactic Acid so as to dissolve the Quinine, and form a solution neutral or only faintly acid to Litmus paper, and make the measure up to 1 oz. with Distilled Water.

**QUININÆ ARSENIAS.**—The composition of this salt being so variable, according to the method of preparation, the compound ($C_{20}H_{24}N_2O_2.AsH_3O_4H_2O$), containing 66 p. c. of Quinine and 29 p. c. of Arsenic Acid, has been recommended as the most stable and otherwise suitable.—*P.J.* xx. 162.

(Russ.; not in the other Pharmacopœias.)

**Dose.**—One-tenth of a grain.

**QUININÆ CARBOLAS.**—The crystalline salt contains 77 p. c. of Anhydrous Quinine. It has been found on the Continent (*Jobst.P.J.*, v. 986) that the preparation sold there under that name was a Sulpho-Carbolate, probably owing to the use of Quinine Sulphate in its manufacture. For extemporaneous preparations, the alkaloid should, of course, be always used, and the best proportions are:—Quinine, 4; Carbolic Acid, 1; melt and cool.

(Not in the Foreign Pharmacopœias.)

**Dose.**—2 grs. for Diarrhœa.

**QUININÆ CITRAS.**—Crystallises in delicate needles; sparingly soluble in Water. Various formulas are given for this salt, QCi; $Q_2Ci$; $Q_2Ci.7H_2O$; but the commercial salt corresponds more closely with $(C_{20}H_{24}N_2O_2)_2H_3C_6H_5O_7.3H_2O$, eq. 894, containing 72·5 p. c. of Quinine.

(Dutch and Port.; not in the others.)

**Solubility.**—1 in 1600 of Water; not soluble in Lemon Juice; slightly in Chloroform.

**QUININÆ HYDRIODAS.**—The neutral salt has about the same solubility in Water as the Sulphate, and dissolves freely in Alcohol and Ether. It is generally found as an amorphous powder. $C_{20}H_{24}N_2O_2.HI$, eq. 452.

**QUININÆ HYDRIODAS ACIDA** ($C_{20}H_{24}N_2O_2.2HI.5H_2O$, eq. 670).

Crystallises in large laminæ of a fine yellow colour, and is soluble 1 in 20 of Water.

**QUININÆ HYDROBROMAS.**—Colourless silky crystals, neutral or slightly alkaline.

It is given *P.J.* v. 303 with $H_2O$, and soluble 1 in 5. Codex with $H_2O$, soluble 1 in 60. Our stock (May 1893) was $C_{20}H_{24}N_2O_2.HBr.H_2O$, containing 76·5 p. c. of Quinine, and soluble about 1 in 55 of Water. After drying at 125° C., its original moisture is again absorbed rapidly from the atmosphere. U.S. (1882) gave the formula with $2H_2O$, and solubility 1 in 16 of Water; U.S. (1893) gives it with $H_2O$, and soluble 1 in 54 of Water.

(Dutch, Fr., Port., Russ., Span., Swiss and U.S.; not in the others.)

**QUININÆ HYDROBROMAS ACIDA** ($C_{20}H_{24}N_2O_2.2HBr.3H_2O$, eq. 540), containing 60 p. c. of Quinine.—Colourless crystals.

(Fr., Bromhydrate de Quinine Neutre; not in the others.)

**Solubility.**—1 in 6 of Water.

**QUININÆ HYDROCHLORAS ACIDA.**—An extremely soluble salt, dissolving in its own weight of Water. It is crystallised with difficulty, and is generally obtained by evaporation to dryness, and powdered. $C_{20}H_{24}N_2O_2.2HCl$, eq. 397, containing 81·6 per cent. of Quinine.

**QUININÆ HYPOPHOSPHIS** ($C_{20}H_{24}N_2O_2.H_2PO_2$, eq. 389).—Generally supplied as an amorphous powder, but it can be crystallised.

(Not in the Foreign Pharmacopœias.)

**Solubility.**—1 in 250 of Water; 1 in 40 of Rectified Spirit.

**QUININÆ LACTAS** ($C_{20}H_{24}N_2O_2.C_3H_6O_3$. eq. 414).—A white crystalline powder, soluble about 1 in 6 of Water, but there is much disagreement about its solubility.

A **solution**, 1 in 4, can be made by neutralising Quinine with Lactic Acid, p. 442.

(Fr.; not in the others.)

**QUININÆ PHOSPHAS.**—It is stated, *P.J.* xxiii. 234, that the English-made salt has the formula $3C_{20}H_{24}N_2O_2.2H_3PO_4.6H_2O$, and the German salt $2C_{20}H_{24}N_2O_2.H_3PO_4.4H_2O$; the former containing 76 p. c. and the latter 79 p. c. of Quinine.

(Not in the Foreign Pharmacopœias.)

**Solubility.**—1 in 420 of Water; 1 in 110 of Rectified Spirit.

**QUININÆ SALICYLAS** ($C_{20}H_{24}N_2O_2.C_7H_6O_3$, eq. 462).—Slightly crystalline powder, prepared by decomposing Sulphate of Quinine with Salicylate of Sodium. It is practically anhydrous, and contains 70 p. c. of Quinine.

(Fr., Russ., Span. and Swiss; not in the others.)

**Solubility.**—1 in 630 of Water; 1 in 24 Rectified Spirit; 1 in 25 of Chloroform.

**QUININÆ SULPHAS ACIDA** ($C_{20}H_{24}N_2O_2.H_2SO_4.7H_2O$, eq. 548).—Colourless crystals, which effloresce on exposure to air. It was originally called the **Neutral Sulphate of Quinine**.

(Austr., Belg., Fr., Hung., Swiss and U.S.; not in the others.)

**Solubility.**—1 in 10 of Water; 1 in 45 of Rectified Spirit.

A **solution** of 1 or 2 grs. to the ounce of Distilled Water applied to the eyes and nostrils for Hay Fever.

**QUININÆ TANNAS.**—A yellowish-white amorphous body; sparingly soluble in Water, very soluble in Alcohol. At one time recommended because of its being tasteless.

(Austr., Belg., Dutch, Fr., Ger., Hung., Ital., Port., Russ., Span., and Swiss; not in the others.)

Large doses recommended in hooping cough, 1½ grains for each year of age.—*L.M.R.* '81, 177.

**QUININÆ TARTRAS** ($(C_{20}H_{24}N_2O_2)_2.C_4H_6O_6.H_2O$, eq. 816).

**Solubility.**—Very sparingly in Water (about 1 in 1000).

Sulphate of Quinine, 80 grs.; Tartaric Acid, 40 grs.; Distilled Water, to measure 4 drms., has been used in India for **hypodermic injection.**

**QUININÆ VALERIANAS** ($C_{20}H_{24}N_2O_2.C_5H_{10}O_2.H_2O$, eq. 444).—A white crystalline salt, smelling, but not strongly, of Valerianic Acid.

(Belg., Fr., Ital., Port., Russ., Span., Swed., Swiss and U.S.)

Made by decomposing Hydrochlorate of Quinine with Valerianate of Sodium.

**Solubility.**—1 in 120 of cold Water; 1 in 2 of Rectified Spirit; 1 in 14 of Ether.

**Dose.**—1 to 3 grs.

**SYRUPUS QUININÆ DIKINATIS.**—Introduced by Dr. Donovan of Dublin.

1 drm. contains 2 grs. of Dikinate of Quinine, which are equal to 3¾ oz. of Decoction of Bark, or 96 grs. of Powdered Bark.

**Dose.**—½ to 1 drm.

**WARBURG'S TINCTURE FOR MALARIAL FEVER.**—Dr. Carl Warburg's contains Quinine. The formula for this is given in the *M.T.* '75, ii. 540, with some interesting cases by Professor Maclean, C.B.

**QUINETUM.**—The mixed Alkaloids from the E. I. Red Bark. The Sulphate resembles Sulphate of Quinine, and is given in the same doses.

**Solubility.**—Sparingly in Water; 1 in 90 of Rectified Spirit.

**QUINIDINÆ SULPHAS** $(C_{20}H_{24}N_2O_2)_2 . H_2SO_4 2H_2O$, eq. 782.—White silky crystals.

(Fr. and U.S.; not in the others.)

**Solubility.**—1 in 200 of Water; 1 in 24 of Rectified Spirit.

**QUINOIDIN,** *Syn.* CHINOIDIN. — A mixture of alkaloids, mostly amorphous, obtained as a by-product in the manufacture of the crystallisable alkaloids from Cinchona. A brownish black mass with alkaline reaction. On ignition should not leave more than ·7 p. c. of ash.

(Norw., Russ. and Swed; not in the others.)

## QUININÆ HYDROCHLORAS.

### HYDROCHLORATE OF QUININE.

$C_{20}H_{24}N_2O_2HCl, 2H_2O$, eq. 396·5.

Obtained from the same sources and by the same process as Sulphate of Quinine, the separated alkaloid being neutralised by Hydrochloric Acid.

**Solubility.**—1 in 34 of Water; 1 in 1 of boiling Water; 1 in 1 of Rectified Spirit; 1 in 1 of Proof Spirit; very soluble in Chloroform.

**Tests.**—Its solution yields a green colour when treated with Chlorine Water and then with Ammonia; with Nitrate of Silver a white precipitate insoluble in Nitric Acid; with Chloride of Barium it gives only a faint turbidity—trace of Sulphate. It may be converted into Sulphate of Quinine by dissolving it together with an equal weight of Sulphate of Sodium in ten times its weight of hot Distilled Water, and setting the mixture aside at 60° F. (15·5° C.) for half an hour. Such Sulphate should respond to the tests mentioned under Quininæ Sulphas.

Dried at 212° F. (100° C.), it loses 9 per cent. of Water.

(Austr., Ger., Hung., and Swiss, Chininum Hydrochloricum; Dan., Norw., and Swed., Chloretum Chinicum; Dutch, Hydrochloras Chinini; Fr., Chlorohydrate de Quinine Basique; Ital., Cloridrato di Chinina; Port., Chlorhydrato de Quinina; Span., Cloruro Quinico; Russ., Chininum Hydrochloratum; U.S.; not in Belg.)

**Medicinal Properties.**—Same as Sulphate of Quinine. This salt is very much more soluble than the Sulphate.

**Dose.**—1 to 10 grs.

### Preparation.

**TINCTURA QUININÆ.**

Hydrochlorate of Quinine, 480 grs.; Tincture of Orange Peel, 60 oz.: dissolve with a gentle heat; allow the solution to remain for three days in a closed vessel, with occasional agitation, and filter.

=(1 grain in 60 minims).

Complete solution is effected at the ordinary temperature, heat is consequently unnecessary.

**Dose.**—½ to 2 drms.

# QUININÆ SULPHAS.

## SULPHATE OF QUININE.

$((C_{20}H_{24}N_2O_2)_2.H_2SO_4)_2.15H_2O$, eq. 1762.

The sulphate of an alkaloid prepared from the powder of various kinds of Cinchona and Remijia Bark by extraction with Spirit after the addition of Lime, or by the action of alkali on an acidulated aqueous infusion, with subsequent neutralisation of the alkaloid by Sulphuric Acid, and purification of the resulting salt.

Considerable discussion has arisen from time to time on the subject of "light" and "heavy" Quinine. Chemically pure Sulphate of Quinine naturally crystallises in hard crystals somewhat resembling Sulphate of Zinc, and at one time it was considered that the light, feathery form was inseparable from the presence of traces of Cinchonidine. In fact, as Cuprea (Remijia) bark contains no Cinchonidine, manufacturers, using this variety alone, were obliged to add a certain proportion of this Sulphate to obtain their Sulphate of Quinine in the "light" form, which was universally in demand. It has more recently been discovered that the addition of a small quantity of Sulphate of Ammonia to the crystallising liquid produces the same effect.—*C.D.* '92, i. 22.

25 grs. of the freshly prepared salt should lose 3·8 grs. of Water by drying at 212° F. (100° C.).

The quantity of Water is very variable, ranging commercially between 5 and 18 p. c., but generally averaging about 14 p. c. Hesse says the uneffloresced salt contains $8H_2O = 16{\cdot}17$ p. c., but it rapidly loses Water on exposure to air till $2H_2O = 4{\cdot}6$ p. c. is reached. As the anhydrous Sulphate absorbs moisture to the same extent, this is the only *stable* Hydrate, and has been recommended for Official adoption.

**Solubility.**—About 1 in 600 of Water; 1 in 25 of boiling Water; 1 in 65 of Rectified Spirit; 1 in 40 of Glycerine.

60 grs. require 60 minims of Diluted Sulphuric Acid or 100 minims of Diluted Phosphoric Acid for solution in 2 oz. of Distilled Water.

66 grs. require 60 minims of Diluted Nitric Acid for solution in 2 oz. of Water.

**Tests.**—Dissolved in pure Sulphuric Acid, has a feeble yellowish tint, and undergoes no further change of colour when gently warmed. Ignited with free access of air, it burns without leaving any residue. Entirely soluble in Water acidulated by Sulphuric Acid. Its solutions give with Chloride of Barium a white precipitate insoluble in Nitric Acid, or when treated first with Solution of Chlorine and afterwards with Ammonia they become of an emerald-green colour.

The Chlorine-Ammonia (Thallioquin) reaction is best obtained in a dilute solution not stronger than $\frac{1}{1000}$; with stronger solutions a dirty green precipitate is produced. Neither this reaction or the fluorescence is shown by Cinchonidine or Cinchonine.

Its solutions give with Solution of Ammonia a white precipitate of Quinine soluble in Ether and in excess of the Solution of Ammonia.

In all the commercial samples we have had occasion to examine, the Ammonia precipitate did *not* completely dissolve in excess of the reagent. This is also noticed in testing other salts of Quinine. But this test was never intended to be applied to a solution stronger than a saturated solution of the Sulphate in cold Water. The B.P. test should specify this.

For a critical résumé of Quinine tests *see* (more particularly) *P.J.* xvii. 554, 645 ; xix. 665 ; *Y.B.P.* '89, 47 ; also more recently *P.J.* xxiii. 839, on precipitation as Oxalate and Chromate.

From the above papers it is evident that the following B.P. test should be modified—(1) by omission of the Sulphuric Acid in dissolving the Sulphate ; (2) by evaporating the mother-liquor to a small bulk (say 1 drm.), and removing the separated crystals before adding the Ether and Ammonia.

*Test for Cinchonidine and Cinchonine.*—Heat 100 grs. of the Sulphate of Quinine in 5 or 6 oz. of boiling Water, with 3 or 4 drops of Diluted Sulphuric Acid. Set the solution aside until cold. Separate, by filtration, the purified Sulphate of Quinine, which has crystallised out. To the filtrate, which should nearly fill a bottle or flask, add Ether, shaking occasionally, until a distinct layer of Ether remains undissolved. Add Ammonia in very slight excess, and shake thoroughly, so that the Quinine at first precipitated shall be redissolved. Set aside for some hours or during a night. Remove the supernatant clear ethereal fluid, which should occupy the neck of the vessel, by a pipette. Wash the residual aqueous fluid and any separated crystals of alkaloid with a very little more Ether, once or twice. Collect the separated alkaloid on a tared filter, wash it with a little Ether, dry at 212° F. (100° C.), and weigh. Four parts of such alkaloid correspond to five parts of crystallised Sulphate of Cinchonidine or of Sulphate of Cinchonine.

*Test for Quinidine.*—Recrystallise 50 grains of the original Sulphate of Quinine as described in the previous paragraph. To the filtrate add Solution of Iodide of Potassium and a little Spirit of Wine to prevent the precipitation of amorphous Hydriodates. Collect any separated Hydriodate of Quinidine, wash with a little Water, dry, and weigh. The weight represents about an equal weight of crystallised Sulphate of Quinidine.

*Test for Cupreine.*—Shake the recrystallised Sulphate of Quinine, obtained in testing the original Sulphate of Quinine for Cinchonidine and Cinchonine, with 1 fl. oz. of Ether and $\frac{1}{4}$ oz. of Solution of Ammonia, and to this ethereal solution, separated, add the ethereal fluid and washings also obtained in testing the original Sulphate for the two alkaloids just mentioned. Shake this ethereal liquor with a quarter of a fl. oz. of a 10 per cent. Solution of Caustic Soda, adding Water if any solid matter separates. Remove the ethereal solution. Wash the aqueous solution with more Ether, and remove the ethereal washings. Add Diluted Sulphuric Acid to the aqueous fluid heated to boiling, until the Soda is exactly neutralised. When cold collect any Sulphate of Cupreine that has crystallised out on a tared filter; dry and weigh.

"Sulphate of Quinine" should not contain much more than 5 per cent. of sulphates of other Cinchona alkaloids.

(In all the Pharmacopœias ; Austr., Ger., Hung., Russ., and Swiss, Chininum Sulfuricum; Belg., Sulphas Quininæ ; Dan., Norw. and Swed., Sulphas Chinicus ; Dutch, Sulphas Chinini ; Fr., Sulfate de Quinine Basique ; Ital., Solfato di Chinina ; Port., Sulfato de Quinina ; Span., Sulfato Quinico ; U.S. Quininæ Sulphas.)

**Medicinal Properties.**—In small doses it acts as a tonic. In large doses it is an antiperiodic in intermittent fevers, and an antipyretic in acute and in specific fevers; it relieves supra-orbital neuralgia. Used as a spray in hay-fever.

Quinine as a parturient.—*B.M.J.* '85, i. 427, 1320.

Quinine in pneumonia.—*B.M.J.* '85, i. 1245.

Quinine in large doses or if taken frequently produces deafness.—*L.M.R.* '81, 177.

**Dose.**—1 to 10 grs. three times daily as a tonic, or in larger doses as an antiperiodic.

It is prescribed in **aqueous solution** assisted by the addition of Diluted Sulphuric Acid or Diluted Hydrochloric Acid, 1 minim to each grain; it also dissolves readily in Tincture of Perchloride of Iron.

One of the most pleasant ways of giving Quinine is in a **mixture** with Citric Acid, to be taken during **effervescence** with a solution containing Bicarbonate of Potassium and Carbonate of Ammonium.

It is best made into **pills** with liquid Glucose.

When a large dose (say 10 grains) is given, it is best suspended in water; the bitterness is not then so intense as when in solution.

In mixtures, Tincture of Orange and sometimes Spirit of Ether are added to prevent it causing headache.

For **hypodermic injection** *see* Not Official salts of Quinine, under each of which the solubilities are given. Of the neutral salts, the Lactate (1 in 4) is the most soluble; of the acid salts, the Hydrochlorate (1 in 1).

Quinine is precipitated from aqueous solutions of its salts by alkalies. In the Ammoniated Tincture of Quinine the alkaloid is dissolved by the Alcohol.

The Infusion of Roses of the Pharmacopœia is a favourite vehicle, but it is always turbid and unsightly: when Pure Quinine is dissolved in the Infusion of Roses with Nitric Acid (*vide* Rosa Gallica) it is bright and attractive in appearance. But if Sulphuric Acid, or even Sulphate of Quinine, is prescribed in this Infusion, it becomes at once turbid.

**Incompatibles.**—All Alkalies and their Carbonates: all infusions containing Tannin throw down a Tannate of Quinine, which Sulphuric Acid, instead of dissolving, helps in precipitating.

Used in the preparation of Ferri et Quininæ Citras.

## Preparations.

### TINCTURA QUININÆ AMMONIATA.

Sulphate of Quinine, 160 grs.; Solution of Ammonia, 2½ oz.; Proof Spirit, 17½ oz.: dissolve the Quinine in the Spirit with a gentle heat, and add the Solution of Ammonia. =(1 gr. in 60 minims).

Heat is unnecessary as the Sulphate of Quinine is readily dissolved by the mixture of Spirit and Ammonia.

**Dose.**—½ to 2 drms. in a wineglass of water.

When mixed with water the Quinine is precipitated in a fine state of division, but the particles soon aggregate and adhere to the sides of the glass; therefore this preparation cannot be prescribed in mixtures, unless Mucilage of Acacia be used to prevent it agglomerating.

When prepared with Carbonate of Ammonium instead of Liquor, the Tincture does not precipitate so badly. It may be diluted with Water thoroughly saturated with Carbonic Acid without any precipitation at all.

When first made, the Tincture usually deposits a little, so it is better to allow a day or two to elapse before filtering. It has been shown (*P. J.* xxi. 511) that this deposit contains Cinchonidine.

(Not in the Foreign Pharmacopœias.)

**VINUM QUININÆ.**

Sulphate of Quinine, 20 grs.; Citric Acid, 30 grs.; Orange Wine, 20 oz.: dissolve first the Citric Acid and then the Sulphate of Quinine in the Wine; let it stand 3 days, and filter. =(1 gr. in 480 minims).

**Dose.**—½ to 1 oz.

(Not in the Foreign Pharmacopœias.)

## RESINA.

### RESIN.

*N.O.Syn.*—COLOPHONIUM.

The residue left after the distillation of the Oil of Turpentine from the crude Oleo-resin (Turpentine) of various species of *Pinus*.

Yellow, translucent.

**Solubility.**—In almost all proportions of Rectified Spirit, Ether, and Oil of Turpentine, and in hot Olive Oil.

(In all the Pharmacopœias; U.S., Resina; Austr., Belg., Dutch, Ger., and Swiss, Colophonium; Dan., Norw., Russ., and Swed., Resina Colophonium; Fr., Colophone and Poix-resine; Hung., Colophonium Depuratum Flavum; Ital., Colophonia; Port., Pez Loaro and Colophonia; Span., Resina Comum de Pino and Colofonia.)

**Medicinal Properties.**—Important as an ingredient of ointments and plasters, but never used internally.

Contained in Charta Epispastica, Emplastra, and Unguentum Terebinthinæ.

### Preparations.

**EMPLASTRUM RESINÆ.** *B.P.Syn.*—ADHESIVE PLASTER.

Resin, 2; Lead Plaster, 16; Curd Soap, 1: melt the Plaster with a gentle heat, add the Resin and Soap, first liquefied, and thoroughly mix. =(1 in 9½).

(Emplastrum Resinæ, U.S.; Emplastrum Adhesivum, Austr., Belg., Dan., Dutch, Ger., Hung., Norw., Russ., Swed., and Swiss; Emplastro de Chumbo Composto, Port.; Emplasto de Diapalma, Span.; all differing in composition; not in Fr. or Ital.)

Used chiefly for strapping wounds and ulcers.

**UNGUENTUM RESINÆ.** *N.O.Syn.*—BASILICON OINTMENT.

Resin, in coarse powder, 4; Yellow Wax, 2; Simple Ointment, 8; Almond Oil, 1: melt with a gentle heat, strain while hot through flannel, and stir till cool. =(1 in 3¾).

(Dan., Ung. Basilicum Nigrum; Fr., Onguent Basilicum; Belg., Ger. and Russ., Ung. Basilicum; Norw., Ung. Basilicum Flavum and Nigrum; Port., Ung. de Resina; Span., Ung. de Colofonia Palida; Swed., Ung. Terebinthinæ Resinosum; Swiss, Ung. Resinosum; U.S., Ceratum Resinæ; all differing in composition. Not in Austr., Dutch or Ital.)

A stimulating dressing for indolent ulcers.

Not Official.

## RESORCINUM.

METADIOXYBENZOLUM.

$C_6H_4(HO)_2$, eq. 110.

White crystals obtained by the destructive distillation of Brazilin or by fusing Benzoldisulphonate of Potassium with Caustic Potash.

**Solubility.**—4 in 3 of Water; 4 in 3 of Rectified Spirit; 1 in 1 of Glycerine; 1 in 1 of Ether.

**Test.**—Its aqueous solution becomes deep violet on the addition of Ferric Chloride.

(Dan., Dutch, Ger., Hung., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Antiseptic and antipyretic. Has been employed in the treatment of acute fevers; also as a **spray** (1 or 2 p. c.) in diphtheria and whooping-cough; 5 to 10 p. c. **solutions** in Glycerine; 5 to 10 p. c. **ointments** in skin diseases.

REFERENCES.—*B.M.J.* '88, i. 435; *L.* '88, i. 570; '90, ii. 1347; '91, ii. 505, 1185; *T.G.* '90, 270.

**Dose.**—1 to 5 grs.

**Antidotes.**—White of egg; wash out the stomach with Soda or Saccharated Lime well diluted; stimulants; Atropine; Nitrite of Amyl.—*Murrell.*

In large doses it produces profuse perspiration, flushing of the face, and giddiness. Dr. Murrell describes a case of poisoning by 2 drms. of it which nearly proved fatal. —*M.T.* '81, ii. 487.

### Preparations.

**LOTIO RESORCINI** (Andeer's Lotion) *B.S.H.*—Resorcin 40 grs., Water 1 oz. Used as an antiseptic and stimulant in foul and syphilitic ulcerations, and to allay irritation in chronic eczema and psoriasis.

**RESORCIN PLASTER MULL** (Unna).—Contains $\frac{3}{4}$ gr. to the square inch.

## RHAMNI FRANGULÆ CORTEX.

FRANGULA BARK.

*B.P.Syn.*—CORTEX FRANGULÆ.

The dried bark of *Rhamnus Frangula.*

Collected from the young trunk and moderate-sized branches, and kept at least one year before being used.

(Austr., Dan., Dutch, Ger., Norw., Russ., and Swed., Cortex Frangulæ; Port., Amieiro Negro; Swiss, Cortex Rhamni Frangulæ; U.S., Frangula; not in the others.)

**Medicinal Properties.**—A laxative or purgative for delicate constitutions and the aged. It is said to be without irritating properties.

### Preparations.

**EXTRACTUM RHAMNI FRANGULÆ.**

Macerate 16 of Rhamnus Frangula Bark, in No. 40 powder, with 40 of Proof Spirit for forty-eight hours in a closed vessel, pack in a percolator, and when the fluid ceases to pass, continue the percolation with Water until 60 have been collected or the Rhamnus is exhausted; evaporate the liquor by a water-bath to a suitable consistence.

**Dose.**—15 to 60 grs.

(Dutch, Russ., and Swed., with boiling Water; not in the others.)

### EXTRACTUM RHAMNI FRANGULÆ LIQUIDUM.

Boil 16 of Rhamnus Frangula Bark in coarse powder, in 3 or 4 successive portions of Distilled Water until exhausted; evaporate the liquors by a water-bath to 12; when cold, add 4 of Rectified Spirit, let it stand for some hours, then filter and make up to 16 with Distilled Water.

**Dose.**—1 to 4 drms.

(Dan., Ger., and U.S. with dilute Spirit; Russ. with Boiling Water; not in the others.)

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## RHAMNI PURSHIANI CORTEX.

### SACRED BARK.

*B.P.Syn.*—CASCARA SAGRADA.

The dried bark of *Rhamnus Purshianus.*

(Austr., Dan., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Laxative. Is especially indicated in chronic constipation, and an atonic condition of the stomach and bowels. It has also been recommended in rheumatism.

### Preparations.

### EXTRACTUM CASCARÆ SAGRADÆ.

Macerate 16 of Cascara Sagrada, in No. 40 powder, in 40 of Proof Spirit for forty-eight-hours; pack in a percolator, and when the fluid ceases to pass, continue the percolation with Water until 60 of liquid is obtained, or the Cascara is exhausted: evaporate the liquor to a suitable consistence.

**Dose.**—2 to 8 grs. in **pill** with Proof Spirit and Gum Acacia in powder.

(Not in the Foreign Pharmacopœias.)

### EXTRACTUM CASCARÆ SAGRADÆ LIQUIDUM.

*B.P.Syn.*—EXTRACTUM RHAMNI PURSHIANI LIQUIDUM.

Boil 16 of Cascara Sagrada in coarse powder, in 3 or 4 successive quantities of Distilled Water until it is exhausted: evaporate the strained liquors by a water-bath to 12, and when cold add 4 of Rectified Spirit; let it stand for some hours, then filter and make up to 16 with Distilled Water.

**B.P.Dose.**—½ to 2 drms. Usual dose, 15 to 30 minims.

(Austr., Dan., Russ., Swiss and U.S. with dilute Spirit; not in the others.)

Given with Ferri et Ammonii Citras and Ammonia.—*B.M.J.* '88, ii. 691.

### Not Official.

**CAPSULES OF CASCARA.**—Two strengths, containing concentrated extract equal to 15 and 30 minims respectively of Fluid Extract in a capsule.

**ELIXIR OF CASCARA** (Kasak).—Under this title is sold a proprietary preparation of Cascara, which is palatable, uniform, and reliable.

**Dose.**—1 or 2 drms. for a child, ½ oz. for an adult.

**ELIXIR CASCARA SAGRADA** (*B.P.C.*).—Tincture of Fresh Orange Peel, 2; Rectified Spirit, 1; Cinnamon Water, 3; Syrup, 6; Liquid Extract of Cascara, 8: mix.

**Dose.**—15 minims to 2 drms.

**EXTRACTUM CASCARA LIQUIDUM INSIPIDUM.**—It having been stated that the disagreeable bitterness of Cascara Sagrada could be prevented or removed by treatment with Magnesia, "tasteless Extracts" have lately attracted considerable attention. Evidence both as to their tastelessness and efficacy is decidedly conflicting. In any case their action seems uncertain and the balance of evidence is against them.—*P.J.* xix. 254—257 ; xx. 491 ; *C.D.* '88, ii. 169, 267, 376 ; '89, i. 19.

**SYRUPUS CASCARA SAGRADA** (*B.P.C.*).—Liquid Extract of Cascara Sagrada, 4 ; Liquid Extract of Liquorice, 3 ; Carminative Tincture, ¼ ; Syrup to make 20 : mix.

**Dose.**—1 to 4 drms.

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# RHEI RADIX.

## RHUBARB ROOT.

The root more or less deprived of its bark, sliced and dried, of *Rheum palmatum*, *Rheum officinale*, and probably other species, collected and prepared in China and Thibet.

The *Rheum ponticum* and *officinale* are grown at Banbury, in Oxfordshire. In four or five years the roots attain the size of a man's arm; in drying, the root loses 75 p. c., and yields a fine yellow powder. A good deal is exported, and some is used in this country.

**Tests.**—Free from decay, not worm-eaten, Boric Acid does not turn the yellow exterior brown. In the powder, adulterations are detected with difficulty.

(In all the Pharmacopœias. Fr., Rhubarbe; Port., Rhuibarbo; Span., Ruibarbo.)

**Medicinal Properties.**—Cathartic and astringent, the latter property not interfering with the former, as the purgative effect precedes the astringent, and therefore is useful in diarrhœa when an aperient is indicated. Given in dyspepsia attended with constipation. It is non-irritant, and increases the effect of other cathartics. It is frequently combined with an antacid.

*Is a certain though not powerful hepatic stimulant.—Dr. Rutherford.*

**B.P.Dose.**—5 to 20 grains.

As a stomachic, 1 to 5 grs. of the powder: as a purgative, 10 to 20 grs.

4 grains of Powdered Rhubarb and 1 minim of "Dispensing Syrup" make a nice **pill.**

Bicarbonate of Sodium in equal weight with Powdered Rhubarb takes off the astringency, and covers the taste; the addition of Peppermint Water still further hides it; or 1 drop of Oil of Peppermint, 30 grs. of Sugar, will disguise the taste of 15 grs. of Powdered Rhubarb, or 1 drop Oil of Nutmeg, 30 grs. Sugar, and 10 grs. of powdered Rhubarb, make a good **draught** with Water to 1½ oz.

### Preparations.

**EXTRACTUM RHEI.**

Rhubarb Root, in No. 40 powder, 16 ; Proof Spirit, 60 ; Distilled Water, a sufficiency: macerate the Rhubarb with the Spirit for forty-eight hours ; pack in a percolator, and when the fluid ceases to pass, continue the percolation with Water until 100 of liquor has been collected or the Rhubarb exhausted. Evaporate the liquor by a water-bath to a suitable consistence for forming pills.

This Extract is much better prepared by successive digestion and expression with Proof Spirit, as in the process for Ext. Calumbæ. After three expressions the quantity of extractive yielded to Water is very small.

**Dose.**—3 to 6 grs. Brit. Ph. dose, 5 to 15 grs.

(Austr., with boiling Water; Belg., Fr., Hung., Ital., Port., Russ., Span. and Swed., with Water; Span., also Alcoholic; Dan., Dutch, Ger., Norw., Swiss and U.S. with Spirit and Water mixed; U.S. has also a **Fluid Extract,** 1 in 1.)

### INFUSUM RHEI.

Rhubarb Root, in thin slices, 1; boiling Distilled Water, 40: infuse half an hour, and strain. =(1 in 40).

**Dose.**—1 to 2 oz.

(Belg., 1 and $13\frac{1}{3}$ (at 90° C.); Fr. 1 in 200 cold; Ital., 3 in 50, Span., 1 in 30; Infusum Rhei Alkalinum.—Dan. and Norw., 1 in 8, Belg. and Swed., 1 in 10; Tinctura Rhei Aquosa.—Austr., 1 in 15 cold Water, Hung., 1 in 16, Ger., Russ., and Swiss, 1 in 10; Dutch, 1 Extract in 20; not in the others.)

### PILULA RHEI COMPOSITA.

Rhubarb Root, in fine powder, 3 oz.; Socotrine Aloes, in fine powder, $2\frac{1}{4}$ oz.; Myrrh, in fine powder, $1\frac{1}{2}$ oz.; Hard Soap, in powder, $1\frac{1}{2}$ oz.; Oil of Peppermint, $1\frac{1}{2}$ drms.; Glycerine, 1 oz.; Treacle, about 3 oz.; all by weight: mix the powders with the Oil, add the Glycerine and Treacle, and beat into a mass.

Glycerine was added in 1885, but too much of both Glycerine and Treacle is ordered in B.P. The Glycerine is best omitted.

**Dose.**—5 to 10 grs.

(Swiss, similar to Brit.; U.S. contains neither Soap, Glycerine, nor Treacle; U.S. has also **Pilula Rhei,** Rhubarb 20, Soap 6, Water q. s.; not in the others.)

### PULVIS RHEI COMPOSITUS. *B.P.Syn.*—GREGORY'S POWDER.

Rhubarb Root, in powder, 2; Light Magnesia, 6; Ginger, in powder, 1: mix. Heavy Magnesia is also permitted. =(1 in $4\frac{1}{2}$).

**Dose.**—20 to 60 grs. 5 to 10 grs. for children.

(Ger. (Pulvis Magnesiæ cum Rheo), and Span. (Polvo de Magnesia con Ruibarbo), Carb. Magnes. 60, Sacch. 40, Rhei 15, Ol. Fœnic. 1; Pulvis Magnesiæ c. Rheo.—Dan., Norw. and Swed., Carb. Magnes. 1, Sugar 1, Rhubarb 1, Oil of Fennel (Dan. $\frac{1}{50}$, N. and S. $\frac{1}{100}$); also Russ. Carb. Magnes. 4, Sugar 2, Rhubarb 1, Oil of Fennel $\frac{1}{25}$; Swiss (Pulvis Magnesiæ Compositus), Rhubarb 2, Sugar 3, Oil of Fennel $\frac{1}{10}$, Carb. Magnesia 5; U.S. Rhubarb 5, Magnesia 13, Ginger 2; not in the others.)

### SYRUPUS RHEI.

Rhubarb Root, 2; Coriander Fruit, 2; both in No. 20 Powder; Refined Sugar, 24; Rectified Spirit, 8; Distilled Water, 24: mix the Rhubarb and Coriander, pack them in a percolator, pass the Spirit and Water, previously mixed, slowly through them, evaporate the liquid that has thus passed until it is reduced to 14, and in this, after it has been filtered, dissolve the Sugar with heat.

The product should weigh nearly 40, and its sp. g. be about 1·310.

A very unsatisfactory formula. The Rhubarb is in too fine powder, and by evaporation as above almost the whole aroma of the Coriander is driven off, and the liquid is difficult to filter. Judging from the strong flavour of commercial samples we should say that in practice the B.P. process was largely modified, and Ol. Coriand. added at the finish.

A good formula is to make a (1 in 4) fluid Extract of Rhubarb with Proof Spirit; evaporate 8 oz. of the fluid Extract to 3 oz.; mix this and 5 minims of Oil of Coriander, with 24 oz. of Sugar, and add Water to make the weight 40 oz.: dissolve in the cold and filter.

**Dose.**—1 to 4 drms.

(Austr., 1 in 26, with Carb. of Potass; Belg., Syr. Rhei, and Syr. Rhei Compositus, both 1 in 20; Dan. and Dutch, 1 in 20, Hung., 1 in 27, Swed., 1 in 14, all with Carb. of Soda; Ger., Russ. and Swiss, with Cassia and Carb. of Potass, 1 in 20; Ital., Scirropo di Cicoria con Rabarbaro; Port., 1 in 20; U.S., Syr. Rhei, 1 in 10, also Syr. Rhei Aromaticus; Fr., Sirop de Rhubarbe Composé; all differ from Brit.; not in Norw. or Span.)

### TINCTURA RHEI.

Rhubarb Root, in No. 20 Powder, 2; Cardamom Seeds, bruised, $\frac{1}{4}$; Coriander, bruised, $\frac{1}{4}$; Saffron, $\frac{1}{4}$; Proof Spirit, 20: macerate for forty-eight hours with 15 of the Spirit, agitating occasionally, pack in a percolator, and when it ceases to drop, pour on the remaining Spirit, press the marc, filter, and add Proof Spirit to make 20. =(1 in 10).

**Dose.**—As a stomachic, 1 to 2 drms.; as a purgative, $\frac{1}{2}$ to 1 oz.

(Belg., Fr., Ital. and Port., Rhubarb only, 1 in 5; Dan., Norw. and Swed. (Tinct. Rhei Amara) 1 and 10; by weight; U.S., 1 in 10, also (Tinct. Rhei Aromat.) 1 in 5, and (Tinct. Rhei Dulcis) 1 in 10; not in the others.)

### VINUM RHEI.

Deposits very much when kept.

Rhubarb Root, in coarse powder, $1\frac{1}{2}$ oz.; Canella Bark, in coarse powder, 60 grs.; Sherry, 20 oz.: macerate seven days, filter, and add Sherry to make 20. =(about 1 in 14).

**Dose.**—1 to 2 drms.

(Belg., about 1 in 17; Fr., 3 in 50; Austr., Ger. and Russ. (Tinct. Rhei Vinosa), also Swiss (Vinum Rhei Compositum), with Orange Peel and Cardamoms.)

## Not Official.

**ELIXIR RHEI** (*B.P.C.*).—Rhubarb Root, in No. 12 Powder, 5; Fennel Fruit, bruised, 2; Glycerine, 3; Refined Sugar, 4; Rectified Spirit 1 volume, diluted with Distilled Water 3 volumes, a sufficient quantity: moisten the Rhubarb and Fennel with 15 of the mixed Spirit and Water; macerate for forty-eight hours, and express. Break up the marc, and add to it sufficient of the menstruum to furnish, with the previous pressing, 15 of clear product. Express again after twenty-four hours' maceration. Unite the liquors, allow to stand for two days, and then filter into the Sugar and Glycerine. Dissolve without heat; then, if necessary, add sufficient of the above menstruum to make the product measure 20.

**Dose.**—1 to 3 drms.

**EXTRACTUM RHEI COMPOSITUM.**

Belg., Dutch and Swiss, Ext. Rhei 3, Ext. Aloes 1, Resina Jalapæ $\frac{1}{2}$, Soap $\frac{1}{2}$.
Dan., Norw. and Swed., Ext. Rhei 5, Ext. Aloes 2, Resin Jalap $1\frac{1}{2}$, Soap $1\frac{1}{2}$.
Ger., Ext. Rhei 3, Ext. Aloes 1, Resina Jalapæ $\frac{1}{2}$, Soap 2.
Russ., Ext. Aloes 2, Ext. Rhei 6, Jalapini Resin 1, Soap 1.

## RHŒADOS PETALA.

RED-POPPY PETALS.

The fresh petals of *Papaver Rhœas;* from indigenous plants.

Chiefly used as a colouring agent.

(Austr., Flores Rhœados; Belg., Flores Papaveris Rhœados; Dutch, Petala Rheados; Fr., Coquelicot; Span., Amapola; Swiss, Flos Rhœados; not in the others.)

### Preparation.

**SYRUPUS RHŒADOS.** Crystallises when kept.

Fresh Red Poppy Petals, 13; Refined Sugar, 36; Distilled Water, 20, or a sufficiency; Rectified Spirit, 2½: add the Petals gradually to the Water, heated in a water-bath, frequently stirring, remove the vessel, and macerate twelve hours, press out the liquor, strain, add the Sugar, and dissolve by heat; when nearly cold, add the Spirit, and Distilled Water to weigh 58, and measure 43½. Sp. g. 1·330.

=(1 in 3½).

**Dose.**—1 to 2 drms.

(Belg., Dutch, Fr. and Span., all different strengths; not in the others.)

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## RICINI OLEUM.

CASTOR OIL.

The Oil expressed from the seeds of *Ricinus communis.*

Colourless or pale straw-yellow, having scarcely any odour.

Sp. g. ·964 at 60° F., and ·949 at 100° F.—*P.J.* xx. 386.

Entirely soluble in one volume of Absolute Alcohol and in (two, changed in subsequent prints to) four volumes of Rectified Spirit.—*Brit. Pharm.*

**Solubility.**—Entirely soluble in all proportions of Absolute Alcohol, Ether, Oil of Turpentine, and Glacial Acetic Acid; 1 in 3½ of Rectified Spirit.

**Test.**—Following the lines suggested by Draper (*Y.B.P.* '71, 101), the following test has been proposed by Conroy, *P.J.* xx. 386:—When 20 c. c. each of Castor Oil and Petroleum Ether (sp. g. ·7033) are well shaken together in a tall tube and kept for some time at exactly 60° F., the mixture will not become clear, and a layer of Petroleum Ether will collect on the surface. If the mixture be raised to 70° F. it will become clear. If the Castor Oil be adulterated with 5 p. c. of another fixed oil, the mixture will be clear at 60° F., and there will be no separation of Ether.

(In all the Pharmacopœias. Fr., Huile de Ricin; Ital., Olio di Rîcino; Port., Oleo de Ricino; Span., Aceite de Ricino.)

**Medicinal Properties.**—A mild and speedy cathartic. Particularly applicable to constipation from indurated fæces, or after swallowing acrid substances, or on the accumulation of acrid secretions. Used in diseases attended with irritation or inflammation of the bowels, as colic, diarrhœa, and dysentery. The safest cathartic for infants, to whom a larger relative dose than to adults may be given; a small quantity in emulsion relieves infantile spasms. It may be administered in an enema with some mucilaginous fluid.

The decoction of the leaves of *Ricinus* applied to the breast is said to produce an abundant supply of milk.

*Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.*

**B.P.Dose.**—1 to 8 fl. drms.

¼ to 1 oz. for adults, 1 to 2 drms. for infants.

One of the least disagreeable modes of taking Castor Oil is to pour it on to some milk contained in a wine glass, the interior and edges of which have been moistened with milk.

Contained in Collodium Flexile, Linimentum Sinapis Comp., and Pil. Hydrarg. Subchloridi Comp.

### Preparation.

**MISTURA OLEI RICINI.**

Castor Oil, 6 drms.; Oil of Lemon, 10 mins.; Oil of Cloves, 2 mins.; Syrup, 1½ drms.; Solution of Potash, 1 drm., Orange Flower Water to produce 2 oz. Mix the Oils in a mortar, then incorporate one-third of the Solution of Potash and afterwards the Syrup, then an additional third of the Solution of Potash, then gradually half of the Orange Flower Water, the remainder of the Solution of Potash, and lastly sufficient Orange Flower Water to produce the required volume. =(3 in 8).

This is Dr. Macnamara's formula, as given by him in "Neligan's Medicines" (1867), p. 205; but the general concensus of opinion seems to be that any other mode of manipulation than the Official one will give a more satisfactory result.

One good method is to mix intimately in a mortar the Oils with the Syrup, and add half the quantity of the Solution of Potash, then gradually the remainder of the Solution of Potash previously mixed with the Orange Flower Water.

The emulsion is produced by the saponification of a small proportion of the Oil by the Liquor Potassæ. As 1 part of Caustic Potash (KHO) is capable of decomposing 5½ parts of Castor Oil, the quantity of Potash in the above formula, if fully combined with Fatty Acid, would form 26 grs. of dry Soap; but it would appear from an analysis of the emulsion that about half of the Potash remains uncombined.

Exception has been taken to the excessive quantity of Oil of Lemon (2½ times the maximum dose of the B.P.) contained in this mixture; but it is probably not more objectionable than the nauseous flavour of the alkaline emulsion without it.

**Dose.**—½ to 2 oz.

### Not Official.

**CAPSULES OF CASTOR OIL.**—Flexible capsules containing 30 minims and 60 minims in each.

**EMULSIO OLEI RICINI.**—Castor Oil, ½ oz.; Mucilage of Acacia, ½ oz.; Syr. Ginger, ¼ oz.; Cinnamon Water, 1 oz.: mix.

Castor Oil, ½ oz.; Yolk of Egg, ¼ oz.; Syrup, ¼ oz.; Peppermint Water, 1 oz.: mix.

Castor Oil, 2 drms.; Solution of Potash, 20 mins.; Syrup, 5 drms.; Water to 2 oz.

**ENEMA OLEI RICINI.**—Castor Oil, 2 oz.; Mucilage of Starch, 18 oz.

## ROSÆ CANINÆ FRUCTUS.

FRUIT OF THE DOG ROSE. HIPS.

The ripe fruit of *Rosa canina;* and other indigenous allied species.

(Fr., Cynorrhodon; Port., Rosa Canina; not in the others.)

**Medicinal Properties.**—Slightly refrigerant and astringent. Chiefly used in confection, as a pill basis, and for making electuaries and linctuses.

### Preparation.

**CONFECTIO ROSÆ CANINÆ.**

Hips, deprived of their seed-like fruits, 1; Refined Sugar, 2: beat the Hips to a pulp in a stone mortar, rub the pulp through a sieve, add the Sugar, and mix thoroughly. =(1 in 3).

(Fr., Conserve de Cynorrhodons; not in the other Pharmacopœias.)

## ROSÆ CENTIFOLIÆ PETALA.

### CABBAGE-ROSE PETALS.

The fresh petals, fully expanded, of *Rosa centifolia;* from plants cultivated in Britain.

(Austr. and Ger., Flores Rosæ; Belg., Flores Rosæ Pallidæ; Fr., Rose à Centfeuilles; Hung., Rosa; Ital., Rosa Pallida; Norw., Petala Rosæ; Port., Rosas Pallidas; Span., Rosa Palida; Swed., Petala Rosæ Centifoliæ; U.S., Rosa Centifolia. Not in the others.)

**Medicinal Properties.**—Slightly laxative, and sometimes given with cathartics, but chiefly used in the preparation of Rose-water.

### Preparation.

**AQUA ROSÆ.**

Fresh Petals of the Hundred-leaved Rose, 1, or an equivalent quantity of the Petals preserved while fresh with Common Salt; Water, 5: distil 1. =(1 in 1).

An agreeable vehicle for medicines; employed in making lotions.

(Same as Fr., Port. and Span.; Belg. and Dutch, 1 in 2½; Ital., 1 in 2; Swed., 1 in 3; Swiss and U.S., Commercial Rose Water; Austr., Ger., Hung. and Russ., 1 in 4000; Dan., 1 in 10,000, all with Otto.)

## ROSÆ GALLICÆ PETALA.

### RED ROSE PETALS.

The unexpanded petals of *Rosa gallica,* fresh and dried; from plants cultivated in Britain.

(Belg., Flores Rosæ Rubræ; Dutch, Petala Rosæ; Fr., Rose Rouge; Ital., Rosa Rossa; Port., Rosas Rubras; Russ., Flores Rosæ Gallicæ; Span., Rosa Rubra; Swed., Petala Rosæ Gallicæ; Swiss, Flos Rosæ; U.S., Rosa Gallica; not in the others.)

**Medicinal Properties.**—Astringent. Often used on account of their colouring matter.

### Preparations.

**CONFECTIO ROSÆ GALLICÆ.**

Fresh Red Rose Petals, 1; Refined Sugar, 3: beat the Petals to a pulp in a stone mortar, add the Sugar, and rub well together. =(1 in 4).

Used as a pill basis. Applied in aphthous conditions of the mouth as a linctus.

**Dose.**—30 to 60 grs., or more.

(Belg., Port. and Span., with powdered Petals, Sugar, and Rose Water; Fr., with powdered Petals, Sugar, Glycerine, and Rose Water; U.S., with powdered Petals, Sugar, Honey, and Rose Water; Swed., with Rosa Centifolia and Sugar; not in the others.)

### INFUSUM ROSÆ ACIDUM.

Dried Red Rose Petals, broken up, 1; Diluted Sulphuric Acid, ½; boiling Distilled Water, 40: infuse for half an hour with the Acid and Water; strain. =(1 in 40).

A similar infusion was in use in 1674.

Astringent. An excellent vehicle for more powerful medicines. An agreeable gargle; but Borax or Alkalies change the colour to green.

**Dose.**—1 to 2 oz.

(Fr., 1 in 100, without acid; Port. (Infuso de Rosas Composto), Red Rose Petals 5, Dilute Sulphuric Acid 2, Boiling Water 200; Swed. (Infusum Rosæ Acidulum), Red Rose Petals 3, Dilute Sulphuric Acid 2, Sugar 8, Boiling Water 200. Not in the others.)

### SYRUPUS ROSÆ GALLICÆ.

Dried Red Rose Petals, 1; Refined Sugar, 15; boiling Distilled Water 10: infuse the Petals in the Water two hours, squeeze through calico, heat the liquor to the boiling-point, and filter; add the Sugar, and dissolve with heat. The product should weigh 23, and measure 17¼. Sp. g. 1·335. =(1 in 17¼).

Mildly astringent. Added to mixtures on account of its colour.

**Dose.**—1 drm.

(Belg. 1 in 10; U.S., with **Fluid Extract,** 1 in 8; not in the others.)

### Not Official.

**EXTRACTUM ROSÆ FLUIDUM** (*U.S.*).—1000 grammes of Roses in No. 30 powder, percolated with a mixture of 100 c. c. Glycerine, and 900 c. c. of Diluted Alcohol until the powder is exhausted. Reserve the first 750 c. c., and evaporate the remainder to a soft extract, dissolve this in the reserved portion, and make up with Diluted Alcohol to 1000 c. c.

**INFUSUM ROSÆ CUM ACIDO NITRICO.**—Rose Petals, broken small, 2; Diluted Nitric Acid, ½; cold Distilled Water, 40: infuse two hours, frequently stirring, strain, and add Powdered Sugar, 1. Used for Quinine draughts, *see* p. 447.

**MEL ROSÆ** (*U.S.*).—Fluid Extract of Roses 12 c. c., Clarified Honey a sufficiency to make the product weigh 100 grammes.

(Ger., Russ. and Swiss, Leaves, 1 in 10; Ital., Infusion of Roses and Honey, evaporated to sp. g. 1·32; not in the others.)

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### Not Official.

## ROSÆ OLEUM.

### OTTO OF ROSE.

A volatile oil distilled from the fresh flowers of *Rosa Damascena.*

A pale yellowish liquid, in which, when cooled, crystalline scales are formed, but which disappear at about 60° F. (15·5° C.). In some samples of oil the Stearoptene is so abundant that, except in warm weather, the oil is almost solid.

The whole fragrance of the oil is contained in the liquid Elœoptene, the solid portion, when freed from the liquid, being destitute of odour. It is stated (*Y.B.P.* '73, 57) that by a process of oxidation, the solid may be converted into the liquid compound, and by a corresponding reduction process, the change may be reversed.

The proportion of Stearoptene may vary between 20 and 60 p. c.; Oil of Geranium is probably the most common adulterant.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Swiss and U.S.; not in Span. or Swed.)

Used as a perfume.

## ROSMARINI OLEUM.

### OIL OF ROSEMARY.

*N.O.Syn.*—Oleum Anthos.

The Oil distilled from the flowering tops of *Rosmarinus officinalis.* Colourless or pale yellow.

That distilled in Britain is superior to the imported.

Ol. Rosmarini Exot. generally shows a sp. g. about ·885, but the English oil about ·905, the latter figure agreeing with most of the published gravities.

**Solubility.**—In all proportions of Absolute Alcohol; 2 in 1 of Rectified Spirit; sparingly in Proof Spirit.

**Test.**—20 minims mixed with an equal bulk of Rectified Spirit does not give any colouration with 1 drop of a dilute solution of Ferric Chloride: this distinguishes it from a large number of essential oils.

Schimmel says: Oil of Rosemary is dextro-rotatory (*see A.J.P.* '91, 303), but we find both Foreign and English Oils to vary between +5° and —9°. The English oils most likely to be genuine are more usually lævo-rotatory.

The following is a comparison, which we made in June, 1893, of the various imported varieties:—

| | | | | | |
|---|---|---|---|---|---|
| 1. | **Eperte** . | price 3/1 per lb., rotation | — 8° | Soluble in *S. V. R.* | 2 in 1 |
| 2. | **Extra** . . | ,, 2/6 ,, ,, ,, | —12° | ,, ,, ,, | 2 in 1 |
| 3. | **Super**. . | ,, 1/9 ,, ,, ,, | —33° | ,, ,, ,, | 2 in 9 |
| 4. | **Fine** . . | ,, 1/3 ,, ,, ,, | —40° | ,, ,, ,, | 2 in 10 |
| | **French Turpentine** | | —57° | ,, ,, ,, | 2 in 8 |

When adulterated with heavy Petroleum Oil, it can be detected by heating it in an open basin on a water-bath until the odour of Rosemary disappears; the Petroleum will be left.

Solid Magenta imparts no colour to Oil of Rosemary, but if Alcohol be present the dye dissolves.—*P.J.* xx. 415.

(In all the Pharmacopœias; Belg., Essentia Rosmarini; Dan., Norw. and Swed., Ætheroleum Rosmarini; Fr., Huile Volatile de Romarin; Ital., Essenza di Rosmarino; Port., Essencia de Alecrim; Span., Esencia de Romero.)

**Medicinal Properties.**—Chiefly used for its odour, which is disliked by insects. It is also used in hair lotions and liniments.

**Dose.**—1 to 4 minims.

Contained in Linimentum Saponis, and Tinctura Lavandulæ Composita.

### Preparation.

**SPIRITUS ROSMARINI.**

Oil of Rosemary, 1; Rectified Spirit, 49: dissolve. =(1 in 50).

**Dose.**—30 to 60 minims.

(Austr. and Swed., from leaves; Belg., Essentia Rosmarini, 1 in 100; Fr. (Teinture d'Essence de Romarin), and Norw., 1 in 50; Port. (Esperito d'Alecrim), and Span. (Alcohol de Romero), from flowering tops; Russ., 1 in 100. Not in the others.)

## RUTÆ OLEUM.

OIL OF RUE.

The Oil distilled from the fresh herb of *Ruta graveolens.*

Pale straw. Sp. g. ·870.

**Solubility.**—In all proportions of Absolute Alcohol; sparingly in Rectified Spirit.

(Belg., Essentia Rutæ; Fr., Huile Volatile de Rue; Port., Essencia de Arruda; Span., Esencia de Ruda; not in the others.)

**Medicinal Properties.**—Stimulant and antispasmodic. Given in flatulence, hysteria, convulsions, and amenorrhœa. A powerful topical stimulant and rubefacient.

**Dose.**—1 to 4 minims in **pill** with Liquorice powder and Soap, p. 405.

### Not Official.

**CONFECTIO RUTÆ.**—Fresh Leaves, 1; Refined Sugar, 3: beat into a mass.

**ENEMA RUTÆ.**—2 to 4 drms. of Confection; warm Water, 10 oz.: administered for flatulent distension in children.

For adults.—Oil of Rue, 20 mins.; Mucilage of Starch, 6 oz.

**SYRUPUS RUTÆ.**—1 minim of Oil to each ounce of Syrup. **Dose.**—½ to 1 drm. for a child.

## SABADILLA.

CEVADILLA.

The dried ripe seeds of *Schœnocaulon officinale.*

The seeds are sometimes imported in, or mixed with, their pericarps, but these should be rejected before the seeds are used.

Imported from Vera Cruz and Mexico.

(Austr., Belg., Dan., Dutch, Fr. (Cevadille), Hung., Ital. (Sabadiglia), Port. (Cevadilha), Russ. and Swiss; not in the others.)

Chiefly introduced into the Pharmacopœia for the purpose of making Veratrine.

## SABINÆ CACUMINA.

SAVIN TOPS.

The fresh and dried tops of *Juniperus Sabina,* collected in spring from plants cultivated in Britain.

(Austr., Belg., Dan., Dutch, Fr., Hung., Ital., Norw., Port., Swed., Swiss and U.S.; not in Ger., Russ. or Span.)

**Medicinal Properties.**—A powerful local and general irritant, used chiefly for keeping open issues. It is a powerful emmenagogue. Used occasionally in gout and chronic rheumatism.

**B.P.Dose.**—4 to 10 grs.

**Antidotes.**—Emetics should first be given; Castor oil, Linseed poultices to the abdomen, opiates and demulcents.

### Preparations.

**OLEUM SABINÆ.**

The Oil distilled in Britain from fresh Savin.

**Solubility.**—4 in 1 of Rectified Spirit, in all proportions of Absolute Alcohol.

**B.P.Dose.**—1 to 4 minims; in **pill** with Soap and Liquorice powder, p. 405.

(Belg., Dutch, Norw., Port., Swed. and U.S.; not in the others.)

**TINCTURA SABINÆ.**

Savin Tops, dried and coarsely powdered, 1; Proof Spirit, 8: macerate forty-eight hours, with 6 of the Spirit, agitating occasionally; pack in a percolator, and when it ceases to drop, pour on the remaining Spirit, press and filter, and add Proof Spirit to make 8. =(1 in 8).

**B.P.Dose.**—20 to 60 minims.

(Belg., Fresh herb 1, Alcohol (92°) 1, by weight; U.S. has a **Fluid Extract** 1 in 1; not in the others.)

**UNGUENTUM SABINÆ.**

Fresh Savin Tops, bruised, 8; Yellow Wax, 3; Benzoated Lard, 16: melt the Lard and the Wax together on a water-bath, add the Savin, digest twenty minutes, strain and press through calico. =(about 1 in 2).

To keep up suppuration from a blister or issue by preventing it from healing, and for application to indolent ulcers.

(Belg., Ext. Sabinæ 1, Simple Ointment 9; Dan., 1 in 4; Swed., Tops 4, Yellow Wax 3, Lard 12; not in the others.)

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## SACCHARINUM. *See* GLUSIDUM.

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## SACCHARUM LACTIS.

SUGAR OF MILK.

*N.O.Syn.*—LACTOSE.

$C_{12}H_{24}O_{12}$, eq. 360.

A crystallised Sugar obtained from the Whey of Milk by evaporation; manufactured largely in Switzerland. Nearly white.

The taste should be but slightly sweet, and only traces of ash should remain on ignition.

**Solubility.**—1 in 6 of cold Water; 1 in 1 of boiling Water; almost insoluble in Rectified Spirit.

(In all the Pharmacopœias. Fr. (Sucre de Lait), Ital. (Lattosio), Port. (Assucar de Leite); Span. (Lactosa).)

**Medicinal Properties.**—As a non-nitrogenous article of diet in consumption and other pulmonary diseases, and in cases of extreme irritability of the stomach, following profuse loss of blood. Used to mix with the food of children; dissolved in water, and mixed with cows' milk, it forms a good substitute for that of the mother. Useful for rubbing with strong medicinal powders, in order to divide them.

**Dose.**—60 to 120 grs. or more in Water.

Used in the preparation of Pulvis Elaterini Compositus, and Ext. Euonymi Siccum.

## SACCHARUM PURIFICATUM.

### REFINED SUGAR.

*B.P.Syn.*—SUCROSE.

$C_{12}H_{22}O_{11}$, eq. 342.

Compact crystalline conical loaves known in commerce as Lump Sugar.

In the former Pharmacopœias, Cane Sugar was specified. Now, Sucrose from any source may be used so long as it answers the test.

Cane Sugar Solutions exposed to light gradually undergo conversion into Glucose. The same change is rapidly effected by boiling with dilute acids, after which it readily reduces Alkaline Solutions of Copper.

**Test.**—Readily and completely soluble in Water, forming a clear bright syrup, which yields no red or yellowish precipitate, or scarcely a trace, on heating it to near the boiling point of water for a short time with a little Solution of Sulphate of Copper and excess of Solution of Potash.

**Solubility.**—100 in 45 of Water, measures 113; 1 in 100 of Rectified Spirit.

(In all the Pharmacopœias except Norw. and Swed.; Fr., Sucre de Canne; Ital., Zucchero; Port., Assucar; Span., Azucar.)

**Medicinal Properties.**—Demulcent, used in catarrhal affections in the form of candy, syrup, etc. Employed almost entirely as a sweetening agent and as a preservative. Enters into the composition of several confections, mixtures, pills, powders, all the syrups, and lozenges.

### Preparation.

**SYRUPUS.**

Refined Sugar, 6; Distilled Water, 3: dissolve the Sugar in the Water with the aid of heat, and when cool add Water to make the weight of the product 9. Sp. g. 1·330. $=(1 \text{ in } 1\frac{1}{6})$.

(In all the Pharmacopœias. Ital., Sciroppo Simplice; Port., Xarope Commun; Span., Jarabe Simple.)

It is convenient to remember that 7 measures of Syrup contain 6 of Sugar.

Used in the preparation of Confectiones Opii and Scammonii, Misturæ Creasoti and Cretæ, Pilula Cambogiæ Composita, Syrupi Aurantii, Chloral, and Zingiberis, and in Tinctura Chloroformi et Morphinæ.

Not Official.

## SALEP.

The prepared tubers of *Orchis Moris*, and other species of *Orchis*.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed. and Swiss; not in U.S.)

**Medicinal Properties.**—Mucilaginous and nutrient.

### Preparation.

**MUCILAGO SALEP.**—Powdered Salep 1: agitate well with cold Water 10; pour on to this, boiling Water 90, and stir till cold.

(Belg., Dutch, Ger., Norw., Russ., Swed. and Swiss., 1 in 100; Dan., Mixtura Saleb, same strength, but containing Syrup of Poppies.)

Salib Misri, the Salep of the Indian Bazaars, is derived from a species of *Eulophia.*

## SALICINUM.

SALICIN.

$C_{13}H_{18}O_7$, eq. 286.

A crystalline glucoside obtained by treating the bark of *Salix alba*, and other species of *Salix*, and the bark of various species of *Populus*, with hot Water, removing tannin and colouring matter from the decoction, evaporating, purifying, and recrystallising.

The bark is obtained principally from Germany and America, that grown in this country, even from the same species, yielding little or no Salicin.—*C.D.* '87, i. 171.

Colourless, silky, acicular crystals and laminæ; bitter and inodorous.

The first issue of B.P., 1885, gave the solubility in Spirit as 1 in 28, changed in subsequent reprints to 1 in 65.

**Solubility.**—1 in 28 of Water; 1 in 1 of boiling Water; 1 in 60 of Rectified Spirit; insoluble in Ether.

**Tests.**—A small quantity heated with a little Bichromate of Potassium, a few drops of Sulphuric Acid, and some Water, yields vapours of an oil having the odour of meadowsweet; on ignition it leaves no residue; Sulphuric Acid colours it red.

(Ital., Port. and U.S.; not in the others.)

**Medicinal Properties.**—Antipyretic and tonic; specially recommended in acute rheumatism; but for this purpose replaced by Salicylate of Sodium. More recently advocated for the prevention and cure of Influenza.

**Dose.**—3 to 20 grs., taken with Water, or in pills with Glucose.

Not Official.

**SALIX NIGRA.**—The bark of this tree has been recommended as a sexual and general sedative.—*B.M.J.* '87, ii. 237; *L.* '88, i. 869.

Its virtues are probably due to Salicin which exists in all species of Salix (Willow).

Not Official.

## SALOLUM.

SALOL.

$C_7H_5O_3.C_6H_5$, eq. 214.

A white crystalline powder having a weak aromatic odour and taste. It splits up into 60 p.c. Salicylic Acid and 40 p.c. Carbolic Acid on being warmed with an alkali. Melts at 42° C. (107·5° F.).

**Solubility.**—Insoluble in cold Water, 1 in 20 of Rectified Spirit, 4 in 3 of Ether, 8 in 3 of Chloroform.

**Tests.**—It dissolves on boiling with several times its weight of Solution of Soda, and the liquid, when cold and acidulated with Hydrochloric Acid, gives off the odour of Phenol, and yields a white precipitate; the latter, when separated by filtration, washed and dissolved in hot Water, gives the salicylic violet colouration with Solution of Perchloride of Iron.

(Dan., Ger., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Antipyretic and antiseptic. It passes through the stomach unchanged, and is decomposed in the duodenum by the alkali of the pancreatic juice. It has been recommended in acute and chronic rheumatism, and in typhoid fever. The best antiseptic for intestinal fermentation. Useful in diarrhœa. When given in excessive doses, or repeated frequently has given rise to toxic symptoms.

In catarrh of the bladder.—*B.M.J.* '87, ii. 1438; good result in gonorrhœa.—*L.* '90, i. 644; an intestinal and urinary disinfectant.—*B.M.J.* '93, i. 643.

**Dose.**—5 to 15 grains as a **powder**, or in **cachets**, or suspended with Mucilage of Acacia or Tragacanth.

**Salacetol** (Salicyl-Acetol) and **Salophen** (Acetyl-para-amido-phenol-salicylic Ester), have been introduced as substitutes for Salol, the former as an intestinal antiseptic, in doses of 20 to 40 grains, and the latter in doses of 15 grains for rheumatism and neuralgia.

They are both practically insoluble in Water, and (like Salol) decomposed by alkalies.

## SAMBUCI FLORES.

ELDER FLOWERS.

The fresh flowers of *Sambucus nigra*, from indigenous plants.

(In all the Pharmacopœias. Fr., Sureau; Ital., Sambuco; Port., Sabugueiro; Span., Sauco.)

### Preparation.

**AQUA SAMBUCI.**

Fresh Elder flowers, separated from the stalks, 1, or an equivalent quantity of the Flowers preserved whilst fresh with Common Salt; Water, 5: distil 1. =(1 in 1).

(Belg., 3 in 10; Fr. (Eau de Sureau), with dried flowers, 1 in 4; Dan., 1 in 10, also Conc. 1 in 1; Port., 1 in 4; Span., 1 in 5; Swed., 1 in 3; Swiss, concentrated, 5 of fresh flowers or 1 of dried flowers in 1; not in the others.)

Chiefly used for **lotions** and **collyria.**

## SANTALI OLEUM.

OIL OF SANDAL WOOD.

*B.P. Syn.*—OLEUM SANTALI FLAVI.

The pale yellow oil distilled from the wood of *Santalum album.*

The principal point of discussion in regard to Sandal Wood Oil has been its sp. g. The B.P. states it is "usually about ·960"; Austr. also ·960; U.S.P. (1882) gave it ·945, altered in 1893 to ·970—·978; Dan. (1893) gives ·970—·985. All the evidence points to ·970 as the lowest allowable sp. g. for a pure Oil. The first distillate is ·960—·964, and the last ·980—·986, the mixed distillates being between ·970 and ·980, with a general tendency towards the higher figure. In the finest commercial Oil the first and last fractions of the distillate are both rejected.

Sp. g.—Samples of Oil distilled in Europe from East Indian wood, *Santalum album*, ·971—·980; Oil distilled in India from *Santalum album*, ·990; Oil distilled in London from wood of Fiji Tree, *Santalum Yasi*, ·977.—*P.J.* xvi. 822; xviii. 661; *C.D.* '89, i. 592. Oil distilled in Liverpool, ·9752.—*P.J.* xxiv. 187.

It has been suggested that the high sp. g. of the Oil distilled in India may be due to a crude method of distillation.—*P.J.* xviii. 908; xxiv. 187.

**Solubility.**—In less than its own weight of Rectified Spirit.

(Austr., Dan., Span. (Esencia de Sandalo Cetrino), Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Has been prescribed extensively for gonorrhœa, in **capsules,** or in a **mixture** suspended with Mucilage.

**Dose.**—10 to 30 minims. Best taken in capsules, as the taste is nauseous.

**Not Official.**

**CAPSULES OF SANDAL OIL.**—Containing 10 and 20 minims in each.

**MISTURA OLEI SANTALI.**—Oleum Santali m xxx; Mucilage of Acacia ʒ i; Syrup ʒ i; Tincture of Orange ʒ ss.; Water to ℥ i, for a dose three times a day.

## SANTONICA.

The dried unexpanded flower-heads or capitula of *Artemisia maritima, var. Stechmanniana.*

**Dose.**—10 to 60 grs.

(Austr., Belg., Dan., Dutch, Ger., Norw., Russ., Swed., and Swiss, Flores Cinæ; Fr., Semen Contra; Ital., Port. and Span., Santonico; U.S. Santonica; not in Hung.)

Used to prepare Santoninum.

## SANTONINUM.

SANTONIN.

$C_{15}H_{18}O_3$, eq. 246.

A crystalline neutral principle, obtained from Santonica.

A process for its preparation is given in B.P.

In colourless, flat, rhombic prisms, feebly bitter.

**Solubility.**—Sparingly in Water; 1 in 350 of boiling Water; 1 in 40 of Rectified Spirit; 1 in 4 of boiling Rectified Spirit; 1 in 160 of Ether; 1 in 2 of Chloroform; about 1 in 400 of Olive Oil; slightly in Glycerine and in Solution of Potash.

**Tests.**—Not dissolved by diluted mineral acids. Leaves no residue when burned with free access of air. Added to warm alcoholic solution of Potash, it yields a violet-red colour.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss. and U.S.)

**Medicinal Properties.**—Anthelmintic. Useful both for round worms and thread-worms. It frequently affects the vision, causing all objects to appear yellow or green.

Santonin has been recommended as an emmenagogue, but writers differ as to its efficacy.—*L.* 85, ii. 430; 86, i. 61, 132, 286.

**B.P.Dose.**—2 to 6 grains.

2 to 3 grs. for children, in Castor Oil. About three doses are sufficient; one every other night, followed by a brisk cathartic the morning after each dose.

### Preparation.

**TROCHISCI SANTONINI.**

Each lozenge contains one grain of Santonin.

**B.P.Dose.**—1 to 6 lozenges.

(Austr., Belg., Ger. and Ital., $\frac{2}{5}$ grain; Dan., Norw., Russ., Swed., Swiss and U.S., $\frac{1}{2}$ grain; Dutch, $\frac{3}{4}$ grain; Fr. and Port., $\frac{1}{6}$ grain; Span., $\frac{1}{3}$ grain in each lozenge; not in Hung.)

## SAPO ANIMALIS.

### CURD SOAP.

A Soda Soap made with purified animal fat consisting principally of Stearin.

White, or with a very light greyish tint, and nearly odourless.

Loses about 8 p. c. by drying and is then easily powdered. Is not affected injuriously by a temperature of 212° F. (100° C.).

**Solubility.**—Sparingly in Water; 1 in $1\frac{1}{2}$ of boiling Water; partially in Rectified Spirit; almost entirely 1 in 2 of boiling Rectified Spirit.

**Tests.**—It does not impart a greasy stain to paper. The ash obtained by incineration does not deliquesce.

(Austr., Sapo Medicinalis; Belg., Sapo Animalis; Dan. and Norw., Sapo Butyraceus; Fr., Savon Animal; Hung., Sapo Albissimus Droguistarum; Ital., Sapone Animale; Port., Sabao Animal; Russ., Sapo Butyrinus, Sapo Sebacinus; Span., Jabon Animal; Swed., Sapo Butyrinus; Swiss, Sapo Stearinicus; Ger. and Russ., Sapo Medicatus, made with Lard and Olive Oil; not in Dutch or U.S.)

Used in the preparation of Emplastrum Resinæ, Extractum Colocynthidis Compositum, Linimentum Potassii Iodidi cum Sapone, Pilula Phosphori, Pilula Scammonii Composita; Suppositoria Acidi Carbolici cum Sapone, Acidi Tannici cum Sapone, and Morphinæ cum Sapone.

### Preparations.

**EMPLASTRUM SAPONIS.**

Curd Soap, 6; Lead Plaster, 36; Resin, 1: to the Lead Plaster, previously melted, add the Soap and the Resin, first liquefied; then, constantly stirring, evaporate to a proper consistence.

=(1 of Soap in $7\frac{1}{6}$).

(Emplastrum Saponis—Belg., 1 in 15; U.S., 1 in 10; Emplastrum Saponatum —Austr., 1 in 16; Dan., 1 in 11; Ger., 1 in 17; Hung., about 1 in 15½; Russ., 1 in 17½; Swiss, 1 in 10; Emplastrum Saponaceum—Swed., 1 in 9; Emplâtre de Savon—Fr., 1 in 18; Emplastro de Sabao—Port., 1 in 12½; Emplasto de Jabon—Span., about 1 in 16; not in Dutch, Ital. or Norw.)

Equal weights of Emplastrum Plumbi and Emplastrum Saponis spread on Amadou are useful to shield any part of the foot from pressure of the boot.

**EMPLASTRUM SAPONIS FUSCUM.** *B.P.Syn.*—Emp. Cerati Saponis.

Curd Soap, in powder, 10; Yellow Wax, 12½; Oxide of Lead (in powder), 15; Olive Oil, 20; Vinegar, 160: boil the Vinegar with the Oxide, by the heat of a steam-bath, constantly stirring them until the Oxide has combined with the Acid; then add the Soap, and boil again until most of the moisture is evaporated: finally, add the Wax and Oil melted together, and stir the whole continuously, maintaining the heat until, by the evaporation of the remaining moisture, the product has acquired the proper consistence for a plaster.

## SAPO DURUS.

### HARD SOAP.

*B.P.Syn.*—White Castile Soap.

Soap made with Olive Oil and Soda.

**Solubility.**—The greater part is soluble 1 in 20 of Water; entirely 1 in 1½ of boiling Water; 1 in 2 of boiling Rectified Spirit.

The Author found that of 30 grains of White Castile Soap digested for four days in 1 ounce of cold Rectified Spirit, only 24 grains were dissolved; when heated it all dissolved.

**Tests.**—Soluble in Rectified Spirit; also in hot Water, the solution being neutral or only faintly alkaline to test-paper. It does not impart a greasy stain to paper. Incinerated it yields an ash which does not deliquesce.

Soap Solution is alkaline to most indicators, *see* Acidum Oleicum.

If a solution of 5 grms. of Soap in 50 c. c. of Water be mixed with 3 c. c. of decinormal Oxalic Acid, the subsequent addition of a few drops of Phenolphthalein *T.S.*, should produce no pink or red tint (limit of alkalinity).—*U.S.P.*

**Medicinal Properties.**—Laxative and antacid. Combined with Rhubarb, it is administered in dyspepsia attended with constipation. Large and frequent doses, wrapped in wafer paper, are most effective in removing gall-stones.

**Dose.**—5 to 15 grs.

(Austr. and Hung., Sapo Venetus; Belg. and Dutch, Sapo Medicatus; Dan., Sapo Medicatus and Sapo Albus Oleaceus; Norw., Sapo Albus Oleaceus; Russ., Sapo Hispanicus Albus; Span., Jabon de Sosa; Swed., Sapo Albus Hispanicus; Swiss, Sapo Oleaceus; U.S., Sapo. With **Almond Oil**—Fr., Savon Médicinal; Hung., Sapo Medicinalis; Ital., Sapone Medicinale; Port., Sabao Vegetal; Span., Jabon Amigdalino. With **Lard** and **Olive Oil**—Ger. and Russ., Sapo Medicatus.)

Used in the preparation of Pilula Aloes Barbadensis, Pil. Aloes et Asafœtidæ Pil. Aloes Socotrinæ, Pil. Cambogiæ Comp., Pil. Rhei Comp., and Pil. Scillæ Comp.

## Preparations.

### LINIMENTUM SAPONIS.

Hard Soap, in fine shavings, 2 oz.; Camphor, 1 oz.; Oil of Rosemary, 3 drms.; Rectified Spirit, 16 oz.; Distilled Water, 4 oz.: mix the Water with the Spirit, add the other ingredients, digest at a temperature not exceeding 70° F. (21·1° C.), agitating occasionally for seven days, and filter. =(1 in 10 nearly).

Contained in Linimentum Opii.

**Linimentum Saponis.**

U.S., Soap, 70 grms.; Camphor, 45 grms.; Oil of Rosemary, 10 c. c.; Alcohol (94°), 750 c. c.; Water to make 1000 c. c.

**Linimentum Saponis Mollis.**

U.S., Soft Soap, 650 grms.; Oil of Lavender, 20 c. c.; Alcohol, 300 c. c.: Water to make 1000 c. c.

**Linimentum Saponis Camphoratum.** All the following by weight:

Swed., Sap. Alb. Hisp., 10; Camphor, 5; Alcohol (64°), 100; Ol. Rosmar., 1.

**Liniment Savonneux.**

Fr., Tincture of Soap (1 to 5), 10; Alcohol (80°), 9; Expressed Oil of Almonds, 1.

**Liniment Savonneux Camphré.**

Fr., Tincture of Soap (1 to 5), 10; Tincture of Camphor (1 to 9), 9; Expressed Oil of Almonds, 1.

**Linimentum Saponato-Camphoratum.**

Austr., Sap. veneti, 8; Sap. communis, 16; Alcohol (70°), 100; Ol. Lavand., 1; Ol. Rosmarini, 1; Liq. Ammoniæ, 4; Camphor, 2; Alcohol (90°), *q.s.*

Ger., Sap. Medic., 80; Camphor, 20; Alcohol (90°), 840; Ol. Thymi, 4; Ol. Rosmar., 6; Liq. Ammoniæ, 50.

Hung., Sap. Alb., 24; Alcohol (70°), 100; Camphor, 2; Ol. Lavand., 1; Ol. Rosmarini, 1; Liq. Ammoniæ, 4.

Russ., Sap. Medicati, 40; Camphor, 10; Alcohol (90°), 420; Ol. Citri, 2; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammoniæ, 25.

**Linimentum Saponato-Camphoratum Liquidum.**

Russ., Spirit Saponati, 175; Spirit Camphor, 60; Liquor Ammoniæ, 12; Ol. Rosmarini, 2; Ol. Thyme, 1.

**Linimento di Sapone con Canfora.**

Ital., Sapo Animale, 15; Alcohol, 125; Camphor, 12; Oil of Rosemary, 5; Solution of Ammonia, 5.

**Linimentum Opodeldoc.**

Norw., Sap. Butyr., 8; Camphor, 2; Alcohol (90°), 84; Sol. Ammon., 4; Ol. Rosmar., 1; Ol. Thymi, 1.

Swed., Sap. Butyr., 30; Camphor, 10; Alcohol (90°), 250; Ol. Thymi, 2; Ol. Rosmar., 3; Sol. Ammon., 15.

**Balsamo Opodeldoc Liquido.**

Span., Soda Soap, 50; Camphor, 25; Alcohol (85°), 500; Ol. Rosmar., 8; Ol. Thymi, 4; Liq. Ammon., 20.

**Balsamo Opodeldoc Solido.**

Span., Animal Soap, 30; Camphor, 24; Alcohol (90°), 250; Ol. Rosmar., 6; Ol. Thymi, 2; Liq. Ammon., 10.

**Balsamum Opodeldoc Liquidum.**

Belg., Spirit Saponis, 725; Spirit Camphor, 225; Liquor Ammoniæ, 30; Ol. Rosmarini, 15; Ol. Thyme, 5.

**Balsamum Opodeldoc Solidum.**

Belg., Sap. Animal., 20; Camphor, 16; Liquid Ammonia, 5; Alcohol (92°), 155; Ol. Rosmar., 3; Ol. Thymi, 1.

**Baume Opodeldoc.**

Fr., Sap. Animal., 15; Camphor, 12; Alcohol (90°), 125; Liq. Ammon., 5, Ol. Rosmar., 3; Ol. Thymi, 1.

**Baume Opodeldoc Liquido.**

Fr., Sap. Dur., 10; Camphor, 9; Alcohol (80°), 100; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammon., 3.

**Opodeldoc.**

Dan., Sapo Butyr., 100; Camphor, 15; Solution of Ammonia, 50; Oil of Rosemary, 10; Oil of Thyme, 10; Spirit (90 p. c.) to make 1000.

Port., Sap. Animal., 16; Camphor, 16; Alcohol (85°), 158; Ol. Lavand., 1; Ol. Rosmar., 1; Liq. Ammon., 8.

Swiss, Lard or Butter, 10; Alcohol (95 p. c.), 5; Sol. Caustic Soda, 5; Saponify and add, Alcohol 162; Camphor, 5; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammon., 10.

**Opodeldoc Liquidum.**

Swiss, Spirit of Soap, 136; Spirit of Camphor (1 to 9), 48; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammon., 13.

**Sapo Aromaticus.**

Dutch, Sap. Med., 14; Alcohol (70°), 80; Camphor, 2; Oil of Rosemary, 1; Liq. Ammon., 3.

**Spiritus Saponis Camphoratus.**

Dan., Caustic Potash, 20; Water, 40; Olive Oil, 100; Spirit, 500; Camphor, 25; Ol. Rosmar., 10; Ol. Thymi, 10; Water to make 1000.

Norw., Sap. Alb., 16; Camphor, 3; Alcohol (64°), 80; Ol. Origani, 1; Ol. Rosmar., 1.

**PILULA SAPONIS COMPOSITA.** *See* OPIUM.

1 gr. Opium powder in 6 nearly.

### Not Official.

**GLYCERINE SOAP.**—There are several makers in this country and on the continent. The soaps are transparent and pleasant to use.

**JUNIPER TAR SOAP, BRECKNELL'S PURE YELLOW SOAP, OXIDE OF ZINC SOAP, CARBOLIC ACID SOAP,** are occasionally prescribed for skin diseases.

## SAPO MOLLIS.

SOFT SOAP.

Soap made with Potash and Olive Oil.

Yellowish-green, inodorous, of a gelatinous consistence.

Redwood stated, that if really made from Olive Oil it will be "yellowish-white" and not "yellowish-green" as in B.P. He also finds 1½ to 3 p. c. of $K_2CO_3$ in Sapo Mollis, insoluble in *S.V.R.*, but reckons it to be free from KHO because he cannot find it in a filtered solution, although an unfiltered solution might give a strong red colour with Phenol-phthalein, inferring that the red colour is wholly due to suspended Carbonate removed by filtration. Draper questions the inference, as Carbonate even is quite sufficiently soluble in Spirit to give a red colour with Phenol-phthalein, and ascribes the non-appearance of the red colour after filtration to the Carbonate becoming converted into Bicarbonate, which is without action on Phenol-phthalein. Both theories are probably incorrect, the apparent loss of alkalinity being due to formation of Acetic Acid by atmospheric oxidation of the Alcohol present.

**Solubility.**—1 in 4 of Water; 1 in 1 of boiling Water; almost entirely 1 in 1 of Rectified Spirit.

**Tests.**—Soluble in Rectified Spirit; not imparting an oily stain to paper. The ash obtained by incineration is very deliquescent.

(Austr., Dutch, Ger., Russ. and Swiss, Sapo Kalinus; Ger. and Swiss, also Sapo Kalinus Venalis; Belg., Russ., Swed. and Hung., Sapo Kalinus Albus and Sapo Kalinus Venalis; Ital., Sapone di Potassa; U.S., Sapo Mollis; not in the others.)

Contained in Linimentum Terebinthinæ.

### Not Official.

**MOLLIN.**—A Soft Soap containing 17 p. c. of uncombined fat and 30 p. c. of Glycerine.

It has been recommended as a basis for ointments.

## SARSÆ RADIX.

### JAMAICA SARSAPARILLA.

The dried root of *Smilax officinalis.*

It is commonly known as Jamaica Sarsaparilla from having been formerly obtained from Central America by way of that island.

(In all the Pharmacopœias; Fr., Salsepareille; Ital., Salsapariglia; Port., Salsaparrilha; Span., Zarzaparrilla.)

**Medicinal Properties.**—Alterative and tonic. Opinions differ as to its efficacy in secondary syphilis. It is given alone or in combination with other remedies.

**Incompatibles.**—Alkalies which accelerate its decomposition.

### Preparations.

**DECOCTUM SARSÆ.**

Jamaica Sarsaparilla, cut transversely, 1; boiling Distilled Water, 12: digest for an hour, boil ten minutes in a covered vessel, cool, and strain, pouring Distilled Water, if required, over the contents of the strainer, or otherwise making the strained product measure 8. =(1 in 8).

**Dose.**—2 to 10 oz.

(Belg., 1 in 10; Fr. (Tisane de Salsepareille), 1 in 20; Span. (Cocimiento de Zarzaparrilla), 1 in 23, contains Liquorice; not in the others.)

**DECOCTUM SARSÆ COMPOSITUM.**

Jamaica Sarsaparilla, cut transversely, 2½; Sassafras Root, in chips, ¼; Guaiacum Wood turnings, ¼; dried Liquorice Root, bruised, ¼; Mezereon Bark, ⅛; boiling Distilled Water, 30: digest for one hour, boil ten minutes in a covered vessel, cool and strain, pouring Distilled Water, if required, over the contents of the strainer, or otherwise making the strained product measure 20. =(1 in 8).

It has been recommended (*C.D.* '84, 279), to use the Oil of Sassafras instead of Chips in preparing Decoctum Sarsæ Compositum, 1 min. being equal to 1 oz. of the Wood. In making the B.P. decoction, probably most of the Oil is volatilised.

The above estimation is low; Sassafras Wood yields 1 to 2 p. c. of Oil.

**Dose.**—2 to 10 oz.

(Port., 1 in 20; U.S., 1 in 10; both similar to Brit.; Austr. and Ger., Decoctum Sarsaparillæ Compositum Fortius, Austr. also Mitius; Belg., Hung., and Swed., Decoctum Zittmanni Fortius and Mitius; Span., Cocimiento Edulcorante de Zarzaparrilla; all differ widely from Brit.; not in the others.)

**EXTRACTUM SARSÆ LIQUIDUM.** *B.P.Syn.*—Liquor Sarsæ.

Jamaica Sarsaparilla, in No. 40 Powder, 40; Proof Spirit, 40; Sugar, 5; Distilled Water (temp. 160° F.), 240: macerate the Sarsaparilla with the Spirit in a closed vessel for 10 days; then press out 20 of liquor, and set this aside; digest the pressed residue in the Water at 160° F. (71·1° C.) for sixteen hours, then strain and press out the liquid, dissolve the Sugar in this, and evaporate by a water-bath to about 18, mix the spirituous and aqueous liquids, and make up the volume to 40 by the addition of Distilled Water. =(1 root in 1).

Sarsaparilla is now ordered in No. 40 powder and digested in Spirit previous to the extraction with Water, but a fluid extract of still finer flavour is obtained by repercolation with a mixture of equal parts Proof Spirit and Water. It is also less liable to fermentation.

Note.—B.P. states that improved exhaustion of the root requires this increased proportion of product as compared with that of B.P. 1867.

A quantity of each preparation was evaporated to dryness and then dried at 105° C. B.P. 1867 yielded 22·4 per cent. and B.P. 1885 yielded 12·3 per cent. after deducting the added Sugar. Both preparations were made from the same bundle of Sarsaparilla, and frothed to about the same extent when shaken up with Water.

**Dose.**—2 to 4 drms.

(U.S., 1 in 1; not in the other Pharmacopœias; Belg., Fr., Port. and Span., have a solid extract.)

## Not Official.

**EXTRACTUM SARSÆ LIQUIDUM COMPOSITUM.**—Jamaica Sarsaparilla, cut transversely, 20 oz.; Sassafras, sliced, 2 oz.; Guaiacum Wood, rasped, 2 oz.; Liquorice Root, bruised, 2 oz.; Mezereon, cut, 1 oz.; Rectified Spirit, 1 oz.; Distilled Water, 6 pints: macerate the first five ingredients in one half of the Water, at a temperature not exceeding 160° F., for six hours, and decant the liquor; digest the residue in the remainder of the Water for the same time, and express; filter the mixed liquors, and evaporate by a water-bath to 9 fluid ounces; when cold add the Spirit. = (2 in 1).

**Dose.**—1 to 4 drms.

(U.S. (ingredients similar, but half strength) with Glycerine; not in the other Pharmacopœias.)

## SASSAFRAS RADIX.

### SASSAFRAS ROOT.

The dried root of *Sassafras officinale,* reduced to chips or shavings.

It contains a Volatile Oil which is largely distilled in America; the yield is about 2 p. c. The bulk of the Oil consists of **Saffrol**, $C_{10}H_{10}O_2$, a compound also extracted from Oil of Camphor. It is much used for scenting soaps.

(Austr., Belg., Dutch, Fr., Ger., Ital., Norw., Port., Russ., Span., Swed. and Swiss, the Root; U.S., the Root-bark; not in Dan. or Hung.)

**Medicinal Properties.**—Stimulant and diaphoretic. Used as an adjuvant to other medicines.

Contained in Decoctum Sarsæ Compositum.

## SCAMMONIÆ RADIX.

### SCAMMONY ROOT.

The dried root of *Convolvulus Scammonia.*

From Syria and Asia Minor.

(Belg.; not in the other Pharmacopœias.)

Introduced for the preparation of Resina Scammonii.

## SCAMMONIÆ RESINA.

### RESIN OF SCAMMONY.

Obtained from Scammony Root by a similar process to that described under Resin of Jalap.

The B.P. adds that "it may also be prepared in a similar way from Scammony," but as the resin was introduced as a cheap substitute for the gum, this permission is not likely to be taken advantage of.

16 oz. Scammony Root produce 1⅛ oz. Resin.

**Solubility.**—It is soluble in almost all proportions of Rectified Spirit or Ether; also soluble in Solution of Potash.

**Tests.**—Entirely soluble in Ether. Its tincture does not render the fresh-cut surface of a potato blue (absence of Guaiacum).

(Belg., Fr., Ital., Swed. and U.S.; not in the others.)

**Medicinal Properties.**—An energetic cathartic. May be used when brisk action is needed, but on account of its griping properties it is rarely used alone. In combination it promotes the action of other medicines, whilst its own harshness is mitigated. A good vermifuge for thread-worms.

*Is a powerful intestinal, but a feeble hepatic irritant.—Dr. Rutherford.*

**Dose.**—3 to 8 grs.

Contained in Extractum Colocynthidis Compositum and Pilula Colocynthidis Composita.

### Preparations.

**CONFECTIO SCAMMONII.**

Resin of Scammony, in fine powder, 3 oz.; Ginger, in fine powder, 1½ oz.; Oil of Caraway, 1 drm.; Oil of Cloves, ½ drm.; Syrup, 3 oz.;

Clarified Honey, 1½ oz.: rub the powders with the Syrup and the Honey into a uniform mass, then add the Oils, and mix. =(1 in 3).

**Dose.**—10 to 30 grs.

(Not in the other Pharmacopœias.)

**PILULA SCAMMONII COMPOSITA.**

Resin of Scammony, 1; Resin of Jalap, 1; Curd Soap in powder, 1; Strong Tincture of Ginger, 1; Rectified Spirit, 2: dissolve with a gentle heat, and evaporate to a pill consistence. Product, 3¼.

**Dose.**—5 to 15 grs.

(Belg. (Pilulæ Hænii), Scammony 1, Resin of Jalap 1, Soap 1, Pill of Aloes with Hellebore 2; not in the other Pharmacopœias.)

**PULVIS SCAMMONII COMPOSITUS.**

Resin of Scammony, 4; Jalap, 3; Ginger, 1; all in fine powder: mix.

**Dose.**—10 to 20 grs. =(1 in 2).

(Port. (Po de Escamonea Composto), Scammony 5, Jalap 4, Ginger 1; not in the other Pharmacopœias.)

## SCAMMONIUM.

### SCAMMONY.

A Gum Resin obtained by incision from the living root of *Convolvulus Scammonia*, hardened in the air.

Chiefly from Smyrna, in Asia Minor; the juice, collected in shells, is allowed to concrete. The purest is known in commerce as Virgin Scammony.

**Solubility.**—Almost entirely dissolved in boiling diluted Rectified Spirit.

**Tests.**—It does not effervesce with Hydrochloric Acid. Boiling Water, agitated with the powder, cooled and filtered, does not strike a blue colour with Tincture of Iodine—indicating absence of Starch. Ether removes about 75 per cent. of Resin; and what remains is chiefly soluble Gum with a little moisture.

In estimating the resin soluble in Ether, it is recommended to use a light Ether (sp. g. ·717), and to break up the residue after evaporating the Ether, and again heat to avoid error due to Resin holding down the Ether.—*P.J.* xxi. 477.

It would probably be better to dry the Scammony, extract with Ether, and weigh the residue.

Note.—Has been adulterated with Resin prepared from the root, which can be detected by odour and colour on comparison with a genuine specimen.—*P.J.* xiv. 397.

(Fr., Ital., Norw., Port. and Span. (Escamonea), Swed., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Similar to those of Resin of Scammony, but Scammony emulsifies with Water, the Resin does not.

**Dose.**—5 to 10 grs.

### Preparation.

**MISTURA SCAMMONII.**

Scammony, in powder, 6 grs.; Fresh Milk, 2 oz.: triturate, and form an emulsion. =(1 in 146).

**Dose.**—The full quantity of the formula for an adult, half for a child.

(Not in the other Pharmacopœias.)

## SCILLA.

### SQUILL.

The bulb of *Urginea Scilla*, divested of its dry membranous outer scales, sliced and dried.

From the Mediterranean coasts.

(In all the Pharmacopœias. Fr., Scille; Ital. and Port., Scilla; Span., Escila.)

**Medicinal Properties.**—A stimulant expectorant and diuretic. It increases the secretion of the bronchial mucous membrane and aids the expectoration of mucus. The Tincture largely diluted with water is the best mode of administering it, a teaspoonful mixed with three tablespoonfuls of water, may be placed at the bedside of a bronchitic patient, and about a teaspoonful taken frequently to relieve the cough.

As an expectorant, it is used with Ipecacuanha and Ammoniacum.

**Dose.**—1 to 2 grs. of the powder.

### Preparations.

**ACETUM SCILLÆ.**

Squill, bruised, 2½; Diluted Acetic Acid, 20; macerate the Squill in the Acid for seven days, then strain with expression, and filter. Sp. g. about 1·038. =(1 in 8).

It is conveniently filtered through Talc.

**Dose.**—15 to 40 minims.

(Austr., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Swed., Swiss and U.S., 1 in 10; Belg., about 1 in 12; Span., 1 in 12: all by weight except U.S.)

**OXYMEL SCILLÆ.**

Vinegar of Squill, 5; Clarified Honey, 8: mix, and evaporate till the sp. g. is 1·32.

It is better to evaporate the Acetum Scillæ to about 2⅗ by weight before adding the Honey.

**Dose.**—½ to 1 drm.

(Austr., Ger., Ital. and Russ., Vinegar of Squill 1, Honey 2; Dan., Vinegar of Squill, 35, Honey to make 100; Norw., Span., and Swed., Vinegar of Squill 1, Honey 3; Dutch, Vinegar of Squill 2, Sugar 1, Honey 1; Fr. and Port., Vinegar of Squill 1, Honey 4; Hung., Extract of Squill 2, Honey 320, Strong Acetic Acid (96 p. c.) 3, Dilute Acetic Acid 4; Swiss, Vinegar of Squill 3, Sugar 3, Honey 4: all by weight. Not in Belg. or U.S.)

**PILULA SCILLÆ COMPOSITA.**

Squill, in fine powder, 1¼; Ginger, in fine powder, 1; Ammoniacum, in powder, 1; Hard Soap, in powder, 1; Treacle, by weight, 2, or a sufficiency: mix the powders, add the Treacle, and beat into a mass.

**Dose.**—5 to 10 grs. =(1 in 5).

(Belg., 1 in 7; not in the other Pharmacopœias.)

**SYRUPUS SCILLÆ.**

Vinegar of Squill, 20; Refined Sugar, 40: dissolve with the aid of a little heat.

Sp. g. about 1·345.

Even when made up to weight, after solution, the sp. g. is higher than the B.P., and the syrup crystallises considerably on keeping. It would be better to reduce the sp. g. to 1·330, that of B.P. 1864.

**Dose.**—½ to 1 drm.

(Belg., Vinegar of Squill 347, Sugar 653 ; Russ., Squill 1, Water 12, Spirit 1, Sugar 18; Swed., Squill 2, Ginger 1, Hyssop 4, Peppermint Water 35, Sugar 63: all by weight; U.S., Vinegar of Squill 45, Sugar 80; Water to measure 100. Not in the others.)

### TINCTURA SCILLÆ.

Squill, bruised, 1 ; Proof Spirit, 8 : macerate for forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator, let it drain, and pour on the remaining Spirit; when it ceases to drop, press, filter, and make up with Proof Spirit to 8. =(1 in 8).

**Dose.**—10 to 30 minims with Paregoric or Tincture of Belladonna for cough.

(Belg., Fr., Ger., Port., Russ., Span., Swed. and Swiss, 1 in 5 : all by weight. U.S., 15 in 100. Not in the others.)

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## SCOPARII CACUMINA.

BROOM TOPS.

The fresh and dried tops of *Cytisus scoparius*, from indigenous plants.

(Port., Giesta ; U.S., Scoparius ; not in the others.)

**Medicinal Properties.**—Diuretic and cathartic. Employed in dropsical complaints.

### Preparations.

### DECOCTUM SCOPARII.

Broom Tops, dried, 1 ; Distilled Water, 20 : boil ten minutes in a covered vessel, then strain, and pour as much Distilled Water over the contents of the strainer as will make the strained product measure 20. =(1 in 20).

**Dose.**—2 to 4 oz.

(Not in the other Pharmacopœias.)

### SUCCUS SCOPARII.

Bruise fresh Broom Tops in a stone mortar, express the juice, and to every 3 measures of juice add 1 of Rectified Spirit; set aside seven days, and filter. Keep it in a cool place.

**Dose.**—1 to 2 drms.

### Not Official.

**SPARTEINA** ($C_{15}H_{26}N_2$, eq. 234).—A liquid alkaloid, heavier than Water, obtained from Broom.

Practically insoluble in Water, soluble in Alcohol, Ether, and Chloroform.

**SPARTEINÆ SULPHAS** ($C_{15}H_{26}N_2.H_2SO_4.5H_2O$, eq. 422).—Colourless crystals, readily soluble in Water.

It is rather a peculiar fact that although Sparteine is dibasic, only half the Acid is indicated by titration with Alkali and Phenol-Phthalein.

(Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Cardiac tonic and diuretic. Useful in mitral disease. It slows and strengthens the pulse. Its action is more rapid and less persistent than that of Digitalis.—*B.M.J.* '86, i. 1246; '88, i. 863; *L.* '87, ii. 203; *P.J.* xvi. 543.

**Dose.**—1 to 4 grains.

**Hypodermic Lamels** containing ½ grain of Sulphate of Sparteine.

**SPARTEINE PERIODIDE.**—$C_{15}H_{26}N_2.2HI.I_3$, eq. 43·7 p. c. of loosely-combined Iodine. Employed as a diuretic in combination with Iodine.

Not Official.

## SCOPOLA.

The dried rhizome of *Scopola carniolica*, known also on the continent as *Scopolia Atropoides.*

The experiments of Dunstan and Chaston (*P.J.* xx. 461) following those of Schmidt (*P.J.* xix. 245), show the alkaloid to be **Hyoscyamine** of which a sample contained ·43 p. c.

The further investigations of Schmidt on this root resulted in the separation of a quantity of **Hyoscine** (Scopolamine) in a crystallisable condition hitherto unobtainable, and so clearing up all questions regarding the formula and properties of this base, *C.D.* '92 i., 771, *see* also Hyoscine, p. 311.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—It would naturally have the same properties as Belladonna and Hyoscyamus. It dilates the pupil, and acts as a local anodyne.

This drug has not "taken" in English practice, but it is used on an immense scale in America for the preparation of "Belladonna" Plaster.

## SENEGÆ RADIX.

SENEGA ROOT.

The dried root of *Polygala Senega.*

From North America.

(In all the Pharmacopœias. Fr., Polygala de Virginie; Ital., Poligala Virginiana; Span., Poligala.)

**Medicinal Properties.**—A stimulating expectorant, diaphoretic and diuretic. It also possesses emmenagogue properties. Chiefly used in chronic bronchitis, combined with Carbonate of Ammonium and Spirit of Chloroform.

### Preparations.

**INFUSUM SENEGÆ.**

Senega Root, in No. 20 powder, 1; boiling Distilled Water, 20: infuse half an hour, and strain. =(1 in 20).

**Dose.**—1 to 2 oz.

(Fr., Tisane de Polygala, 1 in 100; not in the other Pharmacopœias.)

**TINCTURA SENEGÆ.**

Senega Root, in No. 40 powder, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator and let it drain; pour on the remaining Spirit; when the fluid ceases to drop, press, filter, and make up with Proof Spirit to 8.

**Dose.**—½ to 2 drms. =(1 in 8).

(Fr. and Russ. 1 in 5, by weight; Swiss and U.S., **Fluid Extract,** 1 in 1; not in the others.)

Not Official.

**SYRUPUS SENEGÆ.**

Austr., Ger. and Russ.—Senega 5, Alcohol (90°) 5, Water 45; digest two days, strain, express, and filter 40, to which add Sugar 60.

Dan. and Norw., 1 in 25; Hung., 1 in 27; Ital., 1 in 30; Span., 1 in 33; Swed., 1 in 28; all by weight.

Swiss.—Fluid Extract of Senega, 1; Syrup, 19.

U.S.—Fluid Extract of Senega, 160; Water of Ammonia, 4; Sugar, 600; Water to measure 1000.

## SENNA.

SENNA.

The dried leaflets of various species of *Cassia.*

The British Pharmacopœia recognises two kinds:—

**Alexandrian Senna**, the dried leaflets of *C. acutifolia*, imported from Alexandria and sometimes in a more or less contaminated condition, in which case the true Senna leaflets should be carefully separated from all extraneous matters.

**East Indian** or **Tinnivelly Senna**, the dried leaflets of *C. angustifolia* from plants cultivated in Southern India; it is imported without admixture of other leaves or extraneous matters of any kind.

The Alexandrian Senna should be free from admixture of leaves, flowers, and fruit of the Argel (*Solenostemma Argel*). The unequally oblique base, and freedom from bitterness, distinguish the Senna from Argel leaves; the latter are also thicker, greyer, and more wrinkled.

(In all the Pharmacopœias; Fr., Séné; Ital., Sena; Port., Senne; Span., Sen.)

**Medicinal Properties.**—A general and efficient purgative in cases of occasional or habitual constipation. Given in large doses, it occasions griping and nausea; it is therefore best administered with aromatics.

The different kinds of Senna, freed from stalks, are of nearly equal medicinal value.

*Is an hepatic stimulant of feeble power.—Dr. Rutherford.*

**Dose.**—Of powder, 10 to 30 grs.

Used in the preparation of Pulvis Glycyrrhizæ Compositus.

### Preparations.

**CONFECTIO SENNÆ.** *N.O.Syn.*—Lenitive Electuary.

Senna, in fine powder, 7; Coriander, in fine powder, 3; Figs, 12; Tamarind, 9; Cassia Pulp, 9; Prunes, 6; Extract of Liquorice, 1; Refined Sugar, 30; Distilled Water, 24. Boil the Figs and Prunes gently in the Water four hours, and add Water to make up 24; then add the Tamarind and Cassia; macerate for two hours, and rub the pulp through a hair sieve; dissolve the Sugar and Liquorice in the pulped product with a gentle heat; and while still warm mix in the Senna and Coriander. The product should be made to weigh 75, either by evaporation, or the addition of more Water.

**Dose.**—60 to 120 grs. =(1 in 11 nearly).

(In all the Pharmacopœias except Dan., but differing in composition.)

## INFUSUM SENNÆ.

Senna, 1 oz.; Ginger, sliced, 28 grs.; boiling Distilled Water, 10 oz.: infuse half an hour, and strain. =(1 in 10).

From 20 oz. of Infusion only 14 oz. drain out.

**Dose.**—1 to 2 oz.

(Austr. (Inf. Sennæ c. Manna), about 1 in 8; Belg., 1 in 10; Dan., Ger., Norw., Port., Russ., Swed. and Swiss (Compound), 1 in 10; Norw., has also Simple Infusion, 1 in 10; Dutch, 1 in 25; also Compound with Anise Fruit, Rochelle Salt and Liquorice; Hung. (Infusum Laxativum), 1 in 10, with Manna; Ital., 1 in 15; U.S., *see* below; not in the others.)

## MISTURA SENNÆ COMPOSITA. *B.P.Syn.*—BLACK DRAUGHT.

Infusion of Senna, 15; Sulphate of Magnesium, 4; Liquid Extract of Liquorice, 1; Tincture of Senna, 2½; Compound Tincture of Cardamoms, 1½: dissolve the Sulphate of Magnesium in the Infusion with the aid of a gentle heat, then add the Liquid Extract and the Tinctures. =(1 Sulphate of Magnesium in 5½).

**Dose.**—1 to 1½ oz.

(U.S. Infusum Sennæ Comp.—Senna 6, Manna 12, Sulphate of Magnesium 12, Fennel 2, Boiling Water 80, Water sufficient to measure 100 when cold.)

## SYRUPUS SENNÆ.

Senna, broken small, 16 oz.; Oil of Coriander, 3 minims; Refined Sugar, 24 oz.; Distilled Water, 100 oz., or a sufficiency; Rectified Spirit, 3 oz.: digest the Senna in 70 oz. of the Water twenty-four hours at a temperature of 120° F., press out the liquor and strain it; digest the marc in 30 oz. of the Water six hours, at the same temperature, again press and strain; evaporate the mixed liquors in a water-bath to 10 oz.; when cold, add the Rectified Spirit, previously mixed with the Oil of Coriander. Filter, and wash what remains in the filter with Water to make up the filtrate to 16 oz.; add the Sugar, and dissolve with heat. Should weigh 42 oz., and its sp. g. should be about 1·310. =(1 in 2).

**B.P.Dose.**—1 to 4 drms. Usual dose for children, ½ to 1 drm.

(Austr., with Aniseed and Manna; Belg., with and without Manna; Dan., Norw., Russ., and Swed., with Fennel and Manna; Dutch, with simple Syrup; Ger. and Russ., with Fennel; Hung., Syrupus Mannatus, with Aniseed and Manna; Ital., with Manna and Anise; U.S. similar to B. P.; not in Fr., Port., Span. or Swiss.)

## TINCTURA SENNÆ.

Senna, broken small, 5; Raisins, freed from seeds, 4; Caraway Fruit, bruised, 1; Coriander Fruit, bruised, 1; Proof Spirit, 40: macerate the ingredients forty-eight hours in three-fourths of the Spirit, agitating occasionally; pack in a percolator, and when it ceases to drop, pour on the remaining Spirit; press, filter, and make up with Proof Spirit to 40. =(1 in 8).

**Dose.**—1 to 4 drms.

(Belg., Fr., and Swiss, 1 in 5, by weight; not in the others.)

### Not Official.

**EXTRACTUM SENNÆ FRUCTUUM FLUIDUM.**—Exhaust Senna pods with cold Water and evaporate the resulting liquid *in vacuo*, so that one of Fluid Extract shall equal 1 of Senna pods.

Senna Pods have been recently revived as an agreeable aperient.—*L.* '89, ii. 164.

**ACIDUM CATHARTICUM.**—According to Stockman, Cathartic Acid is a coloured glucoside. In the free state it is easily decomposed. It acts locally as an irritant and hence as a purgative when introduced into the alimentary canal.—*P.J.* xv. 751.

Bourgoin and Bouchut, in a lengthy investigation on Senna and Cathartic Acid, conclude, " As a general result of this enquiry it appears that the best preparation is the Infusion of Senna."—*P.J.* ii. 223.

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## SERPENTARIÆ RHIZOMA.

### SERPENTARY RHIZOME.

*B.P. Syn.*—SERPENTARIÆ RADIX.

The dried rhizome and rootlets of *Aristolochia Serpentaria*, or of *Aristolochia reticulata*.

From the southern parts of North America.

(Belg., Dan., Fr., Norw., Port., Span., Swed. and U.S.; not in the others.)

**Medicinal Properties.**—Stimulant, tonic, and diaphoretic. A valuable remedy in the low stages of fever, combined with Carbonate of Ammonium. Used in dyspepsia and in chronic rheumatism and gout.

**Dose.**—Of the powder, 10 to 15 grs.

Used in the preparation of Tinctura Cinchonæ Composita.

### Preparations.

**INFUSUM SERPENTARIÆ.**

Serpentary Rhizome, in No. 20 Powder, 1; boiling Distilled Water, 40; infuse half an hour and strain. =(1 in 40).

**Dose.**—1 to 2 oz.

(Not in the other Pharmacopœias.)

**TINCTURA SERPENTARIÆ.**

Serpentary Rhizome, in No. 40 Powder, 1; Proof Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally, pack in a percolator, and let it drain; pour on the remaining Spirit, and when it ceases to drop, press, filter, and make up with Proof Spirit to 8.

**Dose.**—$\frac{1}{2}$ to 2 drms. =(1 in 8).

(U.S., 1 in 10, also **Fluid Extract**; not in the other Pharmacopœias.)

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## SEVUM PRÆPARATUM.

### PREPARED SUET.

The internal fat of the abdomen of the sheep, *Ovis Aries*, purified by melting and straining.

Fusible at 103° F. (39·4° C).—*Brit. Pharm.*

NOTE.—We found that two pieces of mutton suet taken from different animals, when tried by the method given in the B.P. for taking melting points, fused at 119° F. and 120·5° F.

Dissolves in boiling Alcohol; a portion of it separates on cooling.

(Belg., Norw. and Swiss, Sebum; Dan. and U.S., Sevum; Fr., Suif de Mouton; Ger. and Hung., Sebum ovile; Ital., Grasso di Montone; Port. and Span., Sebo; Russ., Sebum Bovinum Depuratum; not in Austr., Dutch or Swed.)

Contained in Emplastrum Cantharidis, and Unguentum Hydrargyri.

Not Official.

## SIMABA CEDRON.

The bruised seeds used for snake-bites and hydrophobia.—*L.M.R.* '85, 144; *P.J.* xv. 638; *T.G.* '88, 785.

A bitter principle, **Cedrine,** has been isolated.

Not Official.

## SIMARUBA.

### BITTER SIMARUBA, OR MOUNTAIN DAMSON.

The root bark of *Simaruba officinalis,* from the West Indies.

(Dutch, Fr., Port., and Span.; not in the others.)

**Medicinal Properties.**—A bitter tonic. In large doses causes nausea; is diaphoretic and diuretic. Principally used in the asthenic and chronic form of dysentery; may be combined with Opium in epidemic dysentery, and in the advanced stages of diarrhœa.

**Dose.**—15 to 30 grs.

### Preparation.

**INFUSUM SIMARUBÆ.**—Simaruba, bruised, $\frac{1}{2}$ oz.; boiling Water, 1 pint: infuse one hour in a covered vessel, and strain. =(1 in 40).

**Dose.**—1 to 2 oz.

This infusion does not colour the preparations of Iron.

(Fr., Tisane, 1 in 200; not in the other Pharmacopœias.)

## SINAPIS.

### MUSTARD.

The dried ripe seeds of *Brassica nigra* and *B. alba* from plants cultivated in Britain, reduced to powder, mixed.

The whole virtue of Mustard depends upon the fact that when mixed with Water it forms Allyl Sulphocyanide (Mustard Oil). This compound is produced by the action of Myrosin upon Myronate of Potassium in the same way in which the Emulsin and Amygdalin react in the formation of Bitter Almond Oil. Black Mustard contains Myrosin and a large excess of Myronate, and so is in itself able to produce the Oil to some extent. White Mustard contains Myrosin alone, and so can by itself produce no Oil. The best result is obtained by mixing off the black and white variety in such proportions that the Myrosin and the Myronate will mutually decompose each other.

**Test.**—A decoction cooled is not made blue by Tincture of Iodine—indicating absence of Starch.

(In all the Pharmacopœias. Fr., Moutarde; Ital., Senape Nera; Port., Mostarde; Span., Mostaza.)

**Medicinal Properties.**—A powerful stimulant. The powder is taken internally as a condiment; a tablespoonful in half a pint of water as an emetic; used externally as a rubefacient.

### Preparations.

#### CATAPLASMA SINAPIS.

Mustard, in powder, 2½ or a sufficiency; Linseed Meal, 2½; boiling Water and Water, a sufficiency: mix the Linseed Meal with 6 to 8 of boiling Water, and add the Mustard, previously mixed with 2 to 3 of lukewarm Water, and stir them together.

The manipulation is modified, so as to avoid over-heating the Mustard and destroying the Myrosin before it has done its work.

It has been suggested that as Poultices are wholly domestic preparations, "Cataplasmata" should be bodily deleted from the Pharmacopœia. The authorities, however, contend for their retention on the ground that Physicians order Poultices, and nurses ought to have a *definite* line upon which to work. As the only *definite* item in this formula is Linseed Meal 2½ (which is as likely to be ground cake as ground seeds), the argument is not very conclusive.

Used as a counter-irritant in inflammation, as in bronchitis and pneumonia, also for neuralgic pains.

(Fr., Sinapisme, with Mustard only; Span. and Swed., not in the others.)

#### CHARTA SINAPIS.

| | |
|---|---|
| Mustard, in powder . . . . . . | 1 |
| Solution of Gutta-percha . . . . . . | 2 or a sufficiency. |

Mix the Mustard with the Gutta-percha Solution so as to form a semi-fluid mixture, and having poured this into a shallow flat-bottomed vessel, such as a dinner-plate, pass strips of cartridge-paper over its surface so that one side of the paper shall receive a thin coating of the mixture. Then lay the paper on a table with the coated side upwards, and let it remain exposed to the air until the coating has hardened.

Before being applied to the skin, let the Mustard Paper be immersed for a few seconds in tepid Water.

(Belg.; Dutch; Fr., Sinapismes en Feuilles; Dan., Ger. and Hung, Charta Sinapisata; Ital., Carta Senepata; Span., Papel Sinapico; Russ., Charta Sinapina; U.S.; not in the others.)

#### LINIMENTUM SINAPIS COMPOSITUM.

Oil of Mustard, 1 drm.; Ethereal Extract of Mezereon, 40 grs.; Camphor, 120 grs.; Castor Oil, 5 drms.; Rectified Spirit, 32 drms.: dissolve. =(1 in 40).

As the essential oil quickly disappears on keeping, it is better to keep the other ingredients ready mixed and to add the Mustard Oil when required.

A stimulating liniment.

(Spiritus Sinapis :—Austr. and Hung., Oil 1, Spirit 50; Belg., Ger., Russ., Swed. and Swiss, Oil 1, Spirit 49; Span. (Alcohol de Mostaza), Oil 1, Spirit 50; all by weight. U.S., similar to Brit. Ph.; not in the others.)

#### OLEUM SINAPIS.

The Oil distilled with Water from the seeds of Black Mustard, *Brassica nigra*, after the expression of the fixed oil.

Sp. g. 1·015—1·020. Boiling point about 298° F. (147·8° C.).

Messrs. Schimmel give sp. g. 1·025 for the pure essential oil.

**Solubility.**—1 in 50 of Water; readily in Rectified Spirit and Ether.

(Austr. and Hung., Oleum Sinapis Æthereum; Belg., Essentia Sinapis; Dan., Norw., and Swed., Ætheroleum Sinapis; Dutch, Ger., Russ., and Swiss, Oleum Sinapis; Ital., Essenza di Senape; Port., Essencia de Moutarda; Span., Esencia de Mostaza; U.S., Oleum Sinapis Volatile; not in Fr.)

**Medicinal Properties.**—Applied to the skin, it produces almost instant vesication, but when diluted it forms a useful counter-irritant application.

### Not Official.

**APPLICATIO SINAPIS.**—Oil of Mustard, 4 mins.; Eau de Cologne, 1 oz.: mix. The best stimulant for congestion of the capillaries of the internal ear; to be applied behind the ear by means of a brush or absorbent wool.

**INFUSUM SINAPIS.**—Mustard, 2 drms.; boiling Water, 4 oz.: strain. It relieves obstinate hiccough.

**CHARTA SINAPIS, U.S.**—Percolate Black Mustard, in No. 60 powder, with Benzin until the percolate ceases to produce a permanent greasy stain upon blotting paper. Remove and dry the powder by exposure to air: then mix it with as much of the Solution (India-rubber 1, Benzin 10, Carbon Disulphide 10) as will give it a semi-liquid consistence, and let it be spread with a suitable brush on one side of a stiff piece of well sized paper, and allow it to dry. Each square inch of paper should contain about 6 grs. of Mustard.

## SODIUM.

SODIUM.

**Na**, eq. 23.

A soft metal, rapidly oxidising in the air, but showing a bright metallic surface when freshly cut.

Sp. g. 0·97. The metal of the alkali Soda, discovered by Sir Humphrey Davy in 1807. Like Potassium, it has a strong affinity for Oxygen: when thrown on cold water, it instantly fuses to a globule, without combustion, and traverses the surface in all directions; on hot water, however, combustion of the Hydrogen ensues.

It should be preserved in well-stoppered bottles under Mineral Naphtha.

**Test.**—23 grs., cautiously dissolved in Water, requires for neutralisation at least 975 grain-measures of the volumetric solution of Oxalic Acid.

### Preparation.

**LIQUOR SODII ETHYLATIS.** *See* SODII ETHYLATIS LIQUOR.

The above is the only direct Official preparation of Sodium.

Chloride of Sodium is obtained by dissolving Rock Salt in Water, and recrystallising it; some, however, absolutely pure and perfectly white, is found embedded in the common brown Rock Salt.

From Chloride of Sodium the Carbonate of Sodium is now prepared, and from the latter all the other preparations are made.

The salts of Sodium, even in much larger doses, produce a less depressing effect upon the heart than salts of Potassium.

The following are the compounds of Sodium given in the British Pharmacopœia :—

| | Dose. |
|---|---|
| SODA CAUSTICA. | |
| SODA TARTARATA | 1 to 4 drms. |
| SODÆ CHLORINATÆ LIQUOR | 10 to 20 minims. |
| SODÆ LIQUOR. *See* Soda Caustica | $\frac{1}{2}$ to 1 drm. |
| SODII ARSENIAS | $\frac{1}{16}$ to $\frac{1}{8}$ gr. |
| SODII BENZOAS | 10 to 30 grs. |
| SODII BIBORAS. *See* Borax. | 5 to 40 grs. |
| SODII BICARBONAS | 10 to 30 grs. |
| SODII BROMIDUM | 10 to 30 grs. |
| SODII CARBONAS | 5 to 30 grs. |
| SODII CARBONAS EXSICCATA | 3 to 10 grs. |
| SODII CHLORIDUM | 10 to 60 grs. |
| SODII CITRO-TARTRAS EFFERVESCENS | 1 to 2 drms. |
| SODII ETHYLATIS LIQUOR. | |
| SODII HYPOPHOSPHIS | 5 to 10 grs. |
| SODII IODIDUM | 3 to 10 grs. |
| SODII NITRAS. | |
| SODII NITRIS | 2 to 5 grs. |
| SODII PHOSPHAS | $\frac{1}{4}$ to 1 oz. |
| SODII PHOSPHAS EFFERVESCENS | $\frac{1}{4}$ to $\frac{1}{2}$ oz. |
| SODII SALICYLAS | 10 to 30 grs. |
| SODII SULPHAS | $\frac{1}{4}$ to 1 oz. |
| SODII SULPHAS EFFERVESCENS | $\frac{1}{4}$ to $\frac{1}{2}$ oz. |
| SODII SULPHIS | 5 to 20 grs. |
| SODII SULPHOCARBOLAS | 10 to 15 grs. |
| SODII VALERIANAS | 1 to 5 grs. |

Preparations of the above and Compounds of Sodium not official are to be found in the Index.

## SODA CAUSTICA.

### CAUSTIC SODA.

Hydrate of Sodium, **$NaHO$**, eq. 40, with some impurities.

In hard, greyish-white fragments, very alkaline and corrosive.

Procured by boiling down Solution of Soda rapidly in a silver or clean iron vessel until there remains a fluid of oily consistence, a drop of which, when removed on a warmed glass rod, solidifies on cooling. Pour the fluid on a clean silver or iron plate, or into moulds, and as soon as it has solidified break it in pieces.

When required pure it is dissolved in Absolute Alcohol, and the solution evaporated.

Commercial Caustic Soda is found to contain 70 to 93 p. c. of $NaHO$, the Official test allows for 10 p. c. of impurity.

There is on the market a very pure *powdered* Caustic Soda, which is very convenient.

**Solubility.**—1 in 1 of Water; about 1 in 5 of Rectified Spirit.

**Tests.**—Its aqueous solution acidulated with Nitric Acid gives only scanty white precipitates with Nitrate of Silver and Chloride of Barium (limit of Chlorides and Sulphates). 40 grains dissolved in Water leave scarcely any sediment, and require for neutralisation about 900 grain-measures of the volumetric solution of Oxalic Acid.

(Belg., Soda Caustica Fusa; Fr., Soude Caustique; Ital., Soda Caustica; Port., Hydrato de Soda; Span., Sosa Caustica por la Cal; U.S., Soda; not in the others.)

**Medicinal Properties.**—Used externally as a caustic.

### Preparation.

**LIQUOR SODÆ.**

Carbonate of Sodium, 28; Slaked Lime, washed, 12; Distilled Water, 160: dissolve the Carbonate in the Water, boil in a clean iron vessel, gradually mix in the washed Lime, and continue boiling for ten minutes, stirring constantly; allow the insoluble matter to subside and decant into a green glass bottle, with air-tight stopper, and add Distilled Water, if necessary, to make it correspond with the tests of sp. g. and neutralising power.

Note.—The washed Lime is obtained from about 13 oz. of Slaked Lime, washed with Distilled Water (to free from Chloride), until a little of the washings, acidified with Nitric Acid, gives no cloudiness with Nitrate of Silver.

Solution of Soda may also be made (as suggested under Liquor Potassæ) by dissolving solid Caustic Soda in Water and diluting to the required gravity.

**Tests.**—Sp. g. 1·047. 1 fluid ounce (458 grains by weight) requires for neutralisation 470 grain-measures of the volumetric solution of Oxalic Acid. It does not effervesce when added to an excess of Diluted Hydrochloric Acid; nor is the mixture affected by Sulphuretted Hydrogen. Mixed with an equal volume of Distilled Water it gives no precipitate with Solution of Lime or Oxalate of Ammonium —indicating absence of Carbonic Acid and Lime. When it is heated with an excess of Diluted Nitric Acid, and evaporated to dryness, the residue forms with Water a clear solution, which is rendered only slightly turbid by Chloride of Barium and by Nitrate of Silver, and not at all by Ammonia—indicating a trace of Sulphates and Chlorides and absence of Magnesia. Contains 4·1 p.c. of Hydrate of Sodium. =(18·8 grs. to the ounce).

(Belg., Soda Caustica Soluta (30 p.c.), sp. g. 1·330 to 1·334; Swed., Solut. Hydratis Natrici (20 p.c.), sp. g. 1·215—1·219; Fr., Soude Caustique Liquide (29 p.c.), sp. g. 1·332; Ger., Liquor Natri Caustici, and Russ., Natrum Causticum Solutum (15 p. c.), sp. g., 1·168 to 1·172; Hung., Natrium Hydrooxydatum Solutum (32 p.c.), sp. g. 1·35; Port., Hydrato de Soda Liquido (30 p.c.), sp. g. 1·33; Span., Solucion de Sosa Caustica (30 p.c.), sp. g. 1·334; Swiss, Natrium Hydricum Solutum (30 p.c.), sp. g. 1·33; U.S., Liquor Sodæ (about 5 p.c.), sp. g. 1·059; not in the others.)

**Antidotes.**—Same as Liquor Potassæ, p. 421.

Used in the preparation of Antimonium Sulphuratum.

## SODA TARTARATA.

TARTARATED SODA.

*B.P.Syn.*—Tartrate of Sodium and Potassium. Rochelle Salt.

*N.O.Syn.*—Sal Seignette.

$NaKC_4H_4O_6 \cdot 4H_2O$, eq. 282.

Prepared Officially by neutralising Bitartrate of Potassium with an equivalent of Carbonate of Sodium.

In colourless transparent prisms, or halves of prisms of the right-rhombic order, generally eight-sided.

**Solubility.**—1 in 1½ of Water; soluble in its own water of crystallisation when hot; insoluble in Rectified Spirit.

**Tests.**—Entirely soluble in cold water. A strong solution gives a crystalline precipitate with a small quantity of Acetic Acid. 141 grains, heated to redness till gases cease to be evolved, leaves an alkaline residue (Carbonates), which, when treated with Distilled Water, filtered, and well washed, yields a clear solution, requiring for neutralisation 990 grain-measures of the volumetric solution of Oxalic Acid.

(Austr. and Hung., Kalium Natro-tartaricum; Belg., Tartras Sodico-Potassicus; Dan., Norw., and Swed., Tartras Natrico-Kalicus; Dutch, Tartras Kalico-Natricus; Fr., Tartrate de Potasse et de Soude; Ger. and Swiss, Tartarus Natronatus; Ital., Tartrato Sodico-Potassico; Port., Tartrato de Potassa e de Soda; Russ., Natrio-Kalium Tartaricum (Sal Polychrestum Seignetti); Span., Tartrato Sodico-Potasico; U.S., Potassii et Sodii Tartras.)

**Medicinal Properties.**—A mild, cooling purgative, well suited to delicate and irritable stomachs. It is not aperient in small doses, its action being to render the urine alkaline.

*A feeble hepatic, but a powerful intestinal stimulant.—Dr. Rutherford.*

**Dose.**—2 to 4 drms.

### Preparation.

**PULVIS SODÆ TARTARATÆ EFFERVESCENS.** Commonly known as Seidlitz Powder. *N.O.Syn.*—PULVIS AËROPHORUS LAXANS; PULVIS EFFERVESCENS LAXANS.

Tartarated Soda in dry powder, 120 grs.; Bicarbonate of Sodium in dry powder, 40 grs.; mix and wrap in blue paper. Tartaric Acid in dry powder, 38 grs.; wrap in white paper.

**B.P.Dose.**—The former powder dissolved in nearly half a pint of cold or warm Water, and the latter powder then added.

(In all the Pharmacopœias except Dutch and Ital.)

## SODÆ CHLORINATÆ LIQUOR.

SOLUTION OF CHLORINATED SODA.

Chlorinated Lime, 16; Carbonate of Sodium, 24; Distilled Water, 160: dissolve the Carbonate of Sodium in 40 of the Water, thoroughly triturate the Chlorinated Lime with 120 of the Water, and filter; well mix the solutions; again filter. Keep the solution in a stoppered bottle in a cool and dark place.

A colourless alkaline liquid containing about 2½ per cent. of available Chlorine.

Has the reputation of being an unstable solution, but this is an error. It undergoes but slight change, even when kept under ordinary conditions during several months, or even after keeping for a week in an open white glass bottle. It goes yellow on keeping; but the "Codex" preparation (the original Labarraque), prepared by mixing together the *unfiltered* solutions of one part of Chlorinated Lime with two parts of Soda crystals, remains colourless.

**Tests.**—Sp. g. 1·054. It yields only a slight precipitate with Oxalate of Ammonium—indicating only a trace of Lime. 70 grains by weight added to a solution of 20 grains of Iodide of Potassium in 4 ounces of Water, and acidulated with 2 drachms of Hydrochloric Acid, requires for the discharge of the brown colour which the mixture assumes, at least 500 grain-measures of the volumetric solution of Hyposulphite of Sodium.

Test explained under Calx Chlorinata, p. 154.

(Belg. (Hypochloris Sodii Liquidus), Hypochlorite of Calcium 22, Carbonate of Sodium 44, Water 1000; Fr. (Chlorure de Soude liquide), Chlorinated Lime 1, Carbonate of Sodium 2, Water 45; Ital. (Ipoclorito di Sodio), Chlorine passed through a solution of Caustic Soda 1, Water, 10; Port. (Soluto de Soda Chlorada), Hypochlorite of Calcium 1, Carbonate of Sodium 2, Water 40; Russ. (Natrium Hypochlorosum Solutum), Hypochlorite of Calcium 25, Carbonate of Sodium 30, Water to 500; Span. (Solucion de Hipochlorito Sodico), Hypochlorite of Calcium 1, Carbonate of Sodium 2, Water 43; Swed. (Liquor Acidi Hypochlorosi), Carbonate of Sodium 3, Water 10, Chlorine Gas to effervescence; Swiss (Natrium Hypochlorosum Solutum), Hypochlorite of Calcium 4, Carbonate of Sodium 5, Water 120; U.S., Chlorinated Lime 75, Carbonate of Sodium 150, Water to measure 1000; not in the others.)

**Medicinal Properties.**—Stimulant, antiseptic, and resolvent. Used internally in scarlatina, etc.; in dysentery, dyspepsia, and in glandular enlargements, and chronic mucous discharges. Locally, in all affections attended with fœtor, especially in scarlet fever and diphtheria, and may be applied, diluted, as a wash, poultice, or by lint; 4 to 6 drms. in 12 oz. of Water for a **gargle.** Diluted with Water or Glycerine it forms an excellent application to sore nipples. It is also a powerful disinfecting agent.

Recommended in typhoid fever.—*L.* '85, ii. 520.

**Dose.**—10 to 20 minims.

### Preparation.

**CATAPLASMA SODÆ CHLORINATÆ** (CHLORINE POULTICE).

Solution of Chlorinated Soda, 1; Linseed Meal, 2; boiling Water, 4: add the Linseed Meal gradually to the Water, stirring constantly, then mix in the Solution of Chlorinated Soda.

(Not in the other Pharmacopœias.)

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Not Official.

## SODII ACETAS.

ACETATE OF SODIUM.

$NaC_2H_3O_2 . 3H_2O$, eq. 136.

**Solubility.**—1 in 1 of Water; 1 in 30 of Rectified Spirit.

(Belg., Dutch, Fr., Ger., Hung., Ital., Russ., Span., Swed., Swiss and U.S.; not in Austr., Dan., Norw. or Port.)

Used in the preparation of Acetic Ether.

# SODII ARSENIAS.

## ARSENIATE OF SODIUM.

In colourless transparent prisms, which when freshly crystallised have the composition **$Na_2HAsO_4$, $12H_2O$**, eq. 402, (53·7 p.c. Aq.). On exposure to air moisture escapes, and the effloresced salt has the formula **$Na_2HAsO_4$, $7H_2O$**, eq. 312, (40·4 p.c. Aq.). When dried at 300° F. (148·9° C.) it becomes anhydrous, **$Na_2HAsO_4$**, eq. 186.

Although the B.P. does not state definitely which of the two above Hydrates is Official, and to which the dose there given refers, it may be inferred from the alternative figure (7·4 or 4·5 grs. per oz.) given as the strength of the Liquor, that the effloresced Hydrate ($7H_2O$) is intended.

**Solubility.**—1 in 2½ of Water; soluble in its own water of crystallisation when hot.

**Tests.**—Its aqueous solution is alkaline; it precipitates white with Chloride of Barium, Chloride of Calcium, and Sulphate of Zinc, and brick-red with Nitrate of Silver, all soluble in Nitric Acid. 12·4 grains of Anhydrous Arseniate of Sodium (dried at 300° F., 148·9° C.), dissolved in Water, and acidulated with Acetic Acid, requires not less than 34 grains of Acetate of Lead for complete precipitation.

**Dose.**—$\frac{1}{16}$ to $\frac{1}{8}$ grain.

(Belg., dried Salt; Fr., Ital., Port., Span., Swiss and U.S., crystallised; not in the others.)

**Medicinal Properties.**—Similar to those of the Arsenite of Potassium, or Fowler's Solution. Used in skin affections and nervous diseases. It cures eczema more speedily than Liquor Arsenicalis, producing less gastric disturbance and less irritability of the conjunctiva.

### Preparation.

**LIQUOR SODII ARSENIATIS.**

Arseniate of Sodium rendered anhydrous by a heat not exceeding 300° F. (148·9° C.), 9 grs.; Distilled Water, 2 oz.: dissolve.
=(1 in 100).

After being made, this solution deposits a little Silica introduced in the preparation of the Arseniate, but, if filtered, after a few days remains clear.

In Arsenium it is about half the strength of Liquor Arsenicalis.

**Dose.**—5 to 10 minims, carefully increased.

(U.S., same as Brit.; Belg., 1 in 1000; Fr. and Span., crystallised Arseniate of Sodium 1 in 600; Dan., Port., and Swiss, 1 in 500.)

**Pearson's Solution,** Crystallised Arseniate of Sodium, 1; Water 600.

**Antidotes.**—*See* Acidum Arseniosum, page 10.

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# SODII BENZOAS.

## BENZOATE OF SODIUM.

*B.P.Syn.*—Sodæ Benzoas.

**$NaC_7H_5O_2$**, eq. 144.

This salt may be obtained by neutralising Benzoic Acid with solution of Carbonate of Sodium and evaporating to dryness.

A white obscurely crystalline or amorphous powder, inodorous, or having a faint benzoic odour, of a sweetish alkaline taste, and a faint alkaline reaction.

**Solubility.**—1 in 2 of Water; 1 in 25 of Rectified Spirit.

**Tests.**—When a quantity of the salt weighing 10 grains is heated, it melts, emitting a benzoic odour, then chars, and finally leaves a residue weighing about 3·68 grains, which, when dissolved in Water, requires for neutralisation from 69 to 70 grain-measures of the volumetric solution of Oxalic Acid. An aqueous solution gives a yellowish or flesh-coloured precipitate when mixed with solution of Persulphate of Iron.

In former editions of the "Companion" the formula of this compound was given with an additional $H_2O$, this being the composition of the Crystallised salt. But as the crystals are efflorescent, the formula now given approximates more closely (but yet not exactly) to the commercial salt made by the now Official method of evaporation to dryness.

Three commercial samples lately examined contained an average of 4 per cent. of Water, which has not been taken into account in the above quantitative tests, the figures which are given being apparently theoretical rather than experimental, and calculated upon an anhydrous salt. The sample should, therefore, be previously dried at 212° F. (100° C.) before weighing off the quantity to be tested.

Owing also to the practical impossibility of burning the residual charcoal from out of the semi-fused mass of Sodium Carbonate, we think the weight of the residue (3·68 grs.) will not be attainable. With the most careful ignition, 4·2 grs. is the lowest weight we have been able to obtain after heating for an hour over a Bunsen burner.

(Belg., Benzoas Sodicus; Dutch, Benzoas Natricus; Fr., Benzoate de Soude; Hung., Russ. and Swiss, Natrium Benzoicum; Ital., Benzoato di Sodio; Port., Benzoato de Soda; Span., Benzoata de Sosa; U.S., Sodii Benzoas; not in the others.)

**Medicinal Properties.**—Antiseptic; useful in rheumatism and gout.—*L.* '83, i. 673; *B.M.J.* '86, i. 380, 734; in rheumatic arthritis *Pr.* xxv. 218; internally, also locally as 10 per cent. **spray solution,** and insufflation of the powder in diphtheria *Pr.* xxiv. 128; xxv. 131; was expected to have yielded good results in phthisis, *L.* '79, ii. 886.

**Dose.**—10 to 30 grs.

*Is a powerful hepatic stimulant; it is not an intestinal stimulant.—Dr. Rutherford.*

## SODII BICARBONAS.

BICARBONATE OF SODIUM.

*B.P.Syn.*—SODÆ BICARBONAS.

$NaHCO_3$, eq. 84.

Obtained by saturating Carbonate of Sodium with Carbonic Acid, or by reaction of Chloride of Sodium and Bicarbonate of Ammonium.

A white powder, or small opaque irregular scales.

**Solubility.**—1 in 12 of Water; insoluble in Rectified Spirit.

**Tests.**—When supersaturated with Nitric Acid, its solution scarcely precipitates with Chloride of Barium or Nitrate of Silver—indicating a mere trace of Sulphate and Chloride. 84 grains, exposed to a red heat, leave 53 grains of alkaline residue (Carbonate), which requires for neutralisation 1000 grain-measures of the volumetric solution of Oxalic Acid.

20 grains of Bicarbonate of Sodium neutralise 16·7 grains of Citric Acid, or 17·8 grains of Tartaric Acid.

The B.P. also states that " a solution of the salt in cold Water gives a white and not a coloured precipitate with solution of Perchloride of Mercury," and a somewhat similar test was given in U.S. 1882. This should be omitted as in U.S. 1893; we have not yet found a commercial sample which would pass the test.

Traces of Carbonate of Sodium, and also of Water, are probably present in all commercial Sodium Bicarbonate, but it may still pass the B.P. titration test, owing to the counterbalancing influence of the two impurities. The actual Carbonate may be estimated by adding excess of normal solution of Soda free from Carbonate, then excess of Chloride of Barium, and titrate with normal solution of Sulphuric Acid, using Phenol-phthalein as the indicator.

(Austr. and Hung., Natrium Hydrocarbonicum; Belg., Bicarbonas Sodæ; Dan., Dutch, Norw., and Swed., Bicarbonas Natricus; Fr. Bicarbonate de Soude; Ger., Russ. and Swiss, Natrium Bicarbonicum; Ital., Bicarbonato di Sodio; Port., Bicarbonato de Soda; Span., Carbonato (*bi*) Sodico; U.S., Sodii Bicarbonas.)

**Medicinal Properties.**—Analogous to those of the Bicarbonate of Potassium; it is less caustic and irritating than Carbonate of Sodium. Employed as an antacid in dyspepsia. Useful in calculus with excess of Uric Acid, but the corresponding salts of Potassium and Lithium, however, are preferable, as they form soluble salts with Uric Acid. Moistened with water, it is an excellent application to the sting of wasps and gnats.

*Has scarcely any appreciable effect as a stimulant of the liver, even when given in large doses.—Dr. Rutherford.*

**Dose.**—10 to 30 grs.

Used in the preparation of Magnesii Sulphas Effervescens, Pulvis Sodæ Tartaratæ Effervescens, Sodii Citro-Tartras Effervescens, Sodii Phosphas Effervescens, Sodii Sulphas Effervescens.

## Preparations.

**LIQUOR SODÆ EFFERVESCENS.** *B.P.Syn.*—AQUA SODÆ EFFERVESCENS.—SODA WATER.

Bicarbonate of Sodium, 30 grs.; Water, 20 oz.: dissolve and filter, and force into it as much washed Carbonic Acid Gas (obtained by the action of Sulphuric Acid on Chalk) as can be introduced by the pressure of about four atmospheres. Keep the solution in bottles securely closed, to prevent the escape of the compressed Gas.

Each half-pint bottle contains about 15 grains of Bicarbonate of Sodium.

**Test.**—Ten fluid ounces, after being boiled for five minutes, require for neutralisation 178 grain-measures of the volumetric solution of Oxalic Acid.

### TROCHISCI SODII BICARBONATIS.

Each lozenge contains 5 grains of Bicarbonate of Sodium.

**Dose.**—1 to 6 lozenges.

(Austr., Belg., Dutch, Fr., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Dan., Ger. or Hung.)

### Not Official.

**PULVIS SALINUS ANTICHOLERAICUS** (Dr. Stevens).—Bicarbonate of Sodium, 30 grs.; Chloride of Sodium, 20 grs.; Chlorate of Potassium, 7 grs.: for one dose.

Given frequently in a small tumbler of cold Water during cholera, to arrest the pain and purging.

## SODII BROMIDUM.

BROMIDE OF SODIUM.

$NaBr$, eq. 103.

Obtained by a similar process to that described under Potassium Bromide, crystallisation being conducted from warm solutions.

A granular white powder, consisting of small monoclinic crystals, somewhat deliquescent.

**Solubility.**—5 in 6 of Water; 1 in 16 of Rectified Spirit.

**Tests.**—When its aqueous solution is mixed with a little Chlorine Water, and shaken with Chloroform, the latter on falling to the bottom exhibits a red colour. The aqueous solution mixed with Mucilage of Starch and a drop of Chlorine Water or Bromine Water should not exhibit a blue colour. 10 grs. of the dry Salt requires for complete decomposition about 960 grain-measures of the volumetric solution of Nitrate of Silver.

If Bisulphide of Carbon be poured into a solution of the salt (about 1 in 20), then Chlorine Water be added drop by drop and the whole agitated, the Bisulphide will acquire a yellow or yellowish-brown colour without a violet tint.

Bromide containing 1 p. c. of Iodide, gives a distinct violet, unless too much Chlorine be added. Bisulphide of Carbon gives a better colour than Chloroform. One drop of Solution of Chlorinated Soda with one drop of Diluted Hydrochloric Acid may be used instead of Chlorine Water.

As in the case of the Ammonium and Potassium salts, a maximum and minimum titration figure should be given to define the limit of Chloride. U.S. and Ger. allow about 3 p. c. Chloride of Sodium.

(Austr., Ger., Hung., Russ. and Swiss, Natrium Bromatum; Dan. and Dutch, Brometum Natricum; Fr., Bromure de Sodium; Ital., Bromuro di Sodio; Span., Bromuro Sodico; U.S., Sodii Bromidum; not in the others.)

**Medicinal Properties.**—Similar to Bromide of Potassium, but less depressant.

**Dose.**—10 to 30 grs.

It has been recommended as a remedy for sea sickness in 60 grain doses three times a day for at least two days before embarkation on a long voyage, the dose being reduced to half when on board.—*B.M.J.* '81, ii. 730.

## SODII CARBONAS.

CARBONATE OF SODIUM.

$Na_2CO_3.10H_2O$, eq. 286.

In transparent, colourless, laminar crystals of a rhombic shape, containing 63 per cent. of water of crystallisation, which can be driven off by heat; efflorescent; it has a strong alkaline reaction.

**Solubility.**—5 in 8 of Water at 60° F.; 12 in 1 of Water at 100° F.; insoluble in Rectified Spirit.

**Tests.**—When supersaturated with Nitric Acid it precipitates only slightly with Chloride of Barium or Nitrate of Silver—indicating merely a trace of Sulphate and Chloride. 143 grains require for neutralisation at least 960 grain-measures of the volumetric solution of Oxalic Acid. 20 grains neutralises 9·8 grains of Citric Acid.

(In all the Pharmacopœias.)

**Medicinal Properties.**—Antacid, antilithic, and resolvent. Given principally in diseases attended with acidity of the stomach, as gout and dyspepsia.

**Dose.**—5 to 30 grs.

Used in the preparation of Liquor Sodæ, Liquor Sodæ Chlorinatæ, Soda Tartarata, Sodii Arsenias, Sodii Benzoas, Sodii Bicarbonas, Sodii Hypophosphis, Sodii Phosphas and Sodii Sulphocarbolas.

### Preparation.

**SODII CARBONAS EXSICCATA.** $Na_2CO_3$, eq. 106.

Expose the Carbonate of Sodium in a porcelain capsule to a heat applied gently until the crystals crumble to powder; then increase the temperature and continue the action until vapours cease to be evolved. Reduce to powder and keep it in a well-closed vessel.

53 grains are equal to 143 grains of crystallised salt.

**Dose.**—3 to 10 grains three times daily in pill, with Glucose and "Dispensing Syrup."

(Austr., Belg., Dan., Fr., Ger., Hung., Russ. and U.S.; not in the others.)

### Not Official.

**BALNEUM ALKALINUM.**—Crystals of Carbonate of Sodium, 8 or 10 oz. to 60 gallons of Water.

Used in skin diseases as a solvent to remove scabs and scaly incrustations.

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## SODII CHLORIDUM.

CHLORIDE OF SODIUM. COMMON SALT.

$NaCl$, eq. 58·5.

In small, white, crystalline grains, or transparent cubic crystals.

**Solubility.**—1 in 2¾ of Water; 1 in 2¾ of boiling Water; 1 in 200 of Rectified Spirit.

**Tests.**—The aqueous solution is not precipitated by Perchloride of Platinum, but gives with Nitrate of Silver a white precipitate, soluble in Ammonia, but insoluble in Nitric Acid.

Should be free from colour and show no sign of deliquescence. The yellow colour imparted to a non-luminous bunsen-flame should be completely cut off by blue glass, no red colour being visible. It should show little or no turbidity with Barium Chloride, and on agitating energetically with Ammonia, Ammonium Chloride, and Phosphate of Sodium, no precipitate should appear.

(Belg., Dan., Dutch, Fr., Ger., Ital., Port., Russ., Span., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—Antiseptic; in small doses, stimulant, tonic, and anthelmintic; in larger doses, purgative and emetic. It is also antiperiodic in doses of 8 or 12 drachms during the intervals of ague fits. Locally, as a fomentation to sprains and bruises. A salt water bath (1 pound to 4 gallons), is a tonic and excitant of the system, especially in children. A saturated solution syringed up the nostrils is useful in ozæna. A recent cold is greatly relieved by washing the nostrils and gargling the throat with a weak solution of Salt. In case of a leech being swallowed drink a strong solution of Salt.

Its value as a condiment is well known; animals as well as ourselves require it. Soldiers are supplied with it; our army, ·5 (=½ oz.) daily; the French, ·5; Prussian, ·87; Russian, 1·86; for a long time the Russian army had salt-money given, and it was only when scurvy attacked them that the money was stopped and the salt given instead.

The American travellers carry a bag of salt and a knife, and when bitten by snakes, the wound is scraped and salt applied.

Given with Bicarbonate of Sodium and Chlorate of Potassium by Dr. Stevens in all stages of Cholera, and is also effectual in common diarrhœa, *see* p. 489.

*A very feeble hepatic stimulant.—Dr. Rutherford.*

**Dose.**—10 to 60 grs. as a tonic: 120 to 240 grs. as a cathartic.

Used in the preparation of Acidum Hydrochloricum, Hydrargyri Perchloridum, Hydrargyri Subchloridum, and Sodii Carbonas.

## SODII CITRO-TARTRAS EFFERVESCENS.

EFFERVESCENT CITRO-TARTRATE OF SODIUM.

Bicarbonate of Sodium, 17; Tartaric Acid, 9; Citric Acid, 6; Refined Sugar, 5, all in powder: mix the powders thoroughly, place them in a dish or pan of a suitable form heated to between 200° and 220° F. (93·3° and 104·4° C.), and when the particles of the powder begin to aggregate, turn them assiduously until they assume a granular form, then by means of suitable sieves separate the granules of uniform and most convenient size, and preserve them in well-closed bottles.

(Not in the foreign Pharmacopœias.)

**Medicinal Properties.**—A mild saline purgative.

**Dose.**—60 to 120 grs.

## SODII ETHYLATIS LIQUOR.

SOLUTION OF ETHYLATE OF SODIUM.

Metallic Sodium, free from Oxide, 1; Ethylic Alcohol, 20: dissolve the Sodium in the Ethylic Alcohol contained in a flask, the latter being kept cool in a stream of cold Water.

The Solution should be recently prepared.

A colourless syrupy liquid, becoming brown by keeping, containing 19 p. c. of Ethylate of Sodium, $Na.C_2H_5O$. Sp. g. ·867.

Will not remain colourless. For making a colourless solution, if the Sodium be not bright, wash it with a little Alcohol before commencing to make the Liquor.

As first pointed out, *C.D.* '85, 657, this liquor is sure to contain some proportion of ordinary Hydrate. In fact, supposing the Alcohol to contain the 2 per cent. of Water allowed by the Pharmacopœia, it will contain sufficient Water to hydrate 50 p. c. of the Sodium, and considering the rapidity with which the solution will absorb moisture from the atmosphere, and the surfaces with which it will come in contact, it seems very doubtful whether the action of this solution can differ from a simple solution of pure Caustic Soda in Alcohol.

**Tests.**—When heated, it boils and gives off alcoholic vapours, leaving a white salt which, on being strongly heated, chars. If the white salt be mixed with Water and heated, it yields Alcohol, and the solution on evaporation leaves a white residue consisting almost wholly of Caustic Soda.

(Not in the foreign Pharmacopœias.)

**Medicinal Properties.**—Caustic; has been used in the treatment of nævus, nasal polypus, ozæna, and lupus.—*L.* '78, ii. 625; '81, i. 168, 242; *B.M.J.* '85, ii. 344; '88, ii. 762.

It may be applied by means of a glass rod, camel's hair brush, or a quill pen. Alcoholic solution of Opium may be added to relieve the pain, but not Chloroform, as it makes an explosive mixture.

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## SODII HYPOPHOSPHIS.

### HYPOPHOSPHITE OF SODIUM.

$NaPH_2O_2$, eq. 88.

Obtained by adding Carbonate of Sodium to solution of Hypophosphite of Calcium so long as a precipitate of Carbonate of Calcium is formed, then filtering the solution and evaporating it to dryness by the heat of a steam-bath, keeping it constantly stirred when the salt begins to solidify.

A white granular salt having a bitter nauseous taste. It is deliquescent.

The crystals or powder deliquesce slowly in very hot weather, but as soon as it cools (say to 65° F.) it dries up again.

**Solubility.**—1 in 1 of Water; 1 in 2 of Glycerine; almost entirely 1 in 20 of Rectified Spirit.

**Tests.**—At a red heat it ignites, emitting spontaneously inflammable Phosphuretted Hydrogen. Its solution does not effervesce with acids (absence of Carbonate), and gives only a slight cloudiness with Oxalate of Ammonium (trace of Calcium). 5 grains dissolved in ½ ounce of Distilled Water, and the solution boiled for ten minutes with 11½ grains of Permanganate of Potassium and filtered, should afford a nearly colourless solution.

The B.P. also states that its solution "does not give a precipitate with Acetate of Lead," the remarks on this test are given under Calcii Hypophosphis, p. 149.

**Dose.**—5 to 10 grains as a nervine tonic.

(U.S.; Belg., Hypophosphis Sodii; Dutch, Hypophosphis Natricus; Fr., Hypophosphite de Soude; Port., Hypophosphito de Soda; Russ., Natrium Hypophosphorosum; not in the others.)

Sodium Hypophosphite, when mixed with an equal quantity of Sodium Nitrate, forms a highly explosive mixture.—*Y.B.P.* '87, 21.

Not Official.

**SYRUPUS SODII HYPOPHOSPHITIS** (*B.P.C.*).—Dissolve 160 grains Hypophosphite of Sodium in 3 drms. of Distilled Water, filter, and wash the filter with Distilled Water 1 drm. To the filtered solution add sufficient Syrup to produce 20 oz.: mix. Each drachm contains 1 grain Hypophosphite of Sodium.

**Dose.**—1 to 4 drms.

Not Official.

## SODII HYPOSULPHIS.

HYPOSULPHITE OF SODIUM.

$Na_2S_2O_3$, $5H_2O$, eq. 248.

Prepared by digesting a solution of Sulphite of Sodium with Sulphur, or by passing Sulphurous Acid gas through a solution of Sulphide of Sodium.

It crystallises in prisms, which have a bitter saline taste, inodorous. It is easily recognised in solution by adding Hydrochloric Acid, when Sulphur is precipitated and Sulphurous Acid given off.

**Solubility.**—16 in 10 of Water; insoluble in Rectified Spirit.

(Belg., Hyposulphis Sodii; Fr., Hyposulfite de Soude; Ger., Natrium Thiosulfuricum; Port., Hyposulfito de Soda; Russ. and Swiss, Natrium Hyposulfurosum; Span., Hyposulfito Sodico; Swed., Hyposulphis Natricus; U.S.; not in the others.)

**Medicinal Properties.**—It is given for sarcina ventriculi, also in scrofulous, syphilitic, and rheumatic affections; sometimes used as a **lotion** for parasitic skin diseases (1 in 16 of water).

In cases of blood-poisoning.—*L.* '88, i. 320.

**Dose.**—10 to 20 grs.

Largely used in Photography as a fixing agent, acting as a solvent for the unaltered Silver salts.

5 lbs. of the salt dissolved in 100 gallons of Water was recommended for the ordinary drink for cattle as a preventive against Cattle Plague.

## SODII IODIDUM.

IODIDE OF SODIUM.

NaI, eq. 150.

A dry white crystalline deliquescent powder.

Even when to all appearance dry, it may contain as much as 15 p. c. of moisture. According to B.P. it is prepared on the same lines as the Potassium salt; this would result in the formation of crystals containing $2H_2O$, which is excluded by the Nitrate of Silver titration insisting upon a practically anhydrous (99 p. c.) salt. All commercial samples vary much in the proportion of Water which they contain.

**Solubility.**—11 in 6 of Water; 1 in 3 of Rectified Spirit; 1 in 1 of Glycerine.

**Tests.**—The aqueous solution is neutral to Litmus, and does not exhibit a blue colour with solution of Tartaric Acid and Mucilage of Starch (absence of Iodate), and gives only a slight precipitate on the addition of Saccharated Solution of Lime (trace of Carbonate). Solution of Nitrate of Silver added in excess affords a yellowish-white precipitate, which when shaken with diluted Solution of Ammonia yields by subsidence a clear liquid in which excess of Nitric Acid causes very little turbidity (trace of Chloride). 10 grs. require for complete precipitation about 660 grain-measures of the volumetric solution of Nitrate of Silver.

To be of any use, the Nitrate of Silver titration must be conducted on the thoroughly dried salt.

(Austr., Ger., Hung., Russ. and Swiss, Natrium Iodatum; Dutch, Iodetum Natricum; Fr., Iodure de Sodium; U.S., Sodii Iodidum; not in the others.)

**Medicinal Properties.**—Given in the same doses and for similar purposes as the Iodide of Potassium.

It is more assimilable than Iodide of Potassium.—*B.M.J.* '86, i. 748, 1092.

**Dose.**—3 to 10 grs.

## SODII NITRAS.

NITRATE OF SODIUM.

$NaNO_3$, eq. 85.

A native salt (Chili Saltpetre), purified by crystallisation from Water. Colourless. It gives the usual reactions of Nitrates, and is allowed by B.P. to contain traces of Chloride and Sulphate.

**Solubility.**—9 in 10 of Water.

(Belg., Nitras Sodæ; Dutch, Norw. and Swed., Nitras Natricus; Fr., Azotate de Soude; Ger., Hung., Russ. and Swiss, Natrium Nitricum; Ital., Nitrato di Sodio; U.S.; not in the others.)

Used only to prepare Sodii Arsenias.

## SODII NITRIS.

NITRITE OF SODIUM.

$NaNO_2$, eq. 69.

A white or yellowish white deliquescent crystalline salt.

It is frequently found in commerce fused into sticks, with a crystalline fracture.

It is prepared by fusing Sodium Nitrate with reducing substances such as metallic Lead, Barium Sulphide, &c., and if the reduction has been carried too far, free alkali is formed and afterwards becomes carbonated. The "Additions," therefore, defines the aqueous solution as being neutral or slightly alkaline, and giving no more than traces of precipitate with solution of Chloride of Calcium.

**Solubility.**—5 in 6 of Water, 1 in 50 of Rectified Spirit.

**Tests.**—The solution when mixed with Diluted Sulphuric Acid yields a gas which forms ruddy fumes in contact with the air.

The aqueous solution, when mixed with solution of Sulphate of Iron and Acetic Acid, becomes of a deep brown colour.

Acetic Acid is here used to differentiate between Nitrite and Nitrate; the latter requiring a stronger acid, such as Sulphuric, to produce the brown colour.

One grain of the salt, dissolved in water and introduced into a nitrometer and tested with Iodide of Potassium and Diluted Sulphuric Acid, should liberate not less than 325 grain-measures of Nitric Oxide, the gas being almost completely absorbed by strong solution of Sulphate of Iron, corresponding to not less than 95 per cent. of Nitrite of Sodium.

98 per cent. is a common figure obtained from good commercial samples.

In the absence of a nitrometer it may be readily estimated with a standard solution of Permanganate of Potassium; 0·1 gramme of Pure Nitrite of Sodium being equal to 29 cc. $\frac{N}{10}$ solution of Permanganate (containing 3·156 grammes in the litre), or to 9·1 cc. of the Official Liquor Potassii Permanganatis.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been used in angina pectoris.—*L.* '83, ii. 766, 880.

Preferred to the Nitrites of Amyl and Ethyl, because easily given in Water.—*L.* '87, ii. 51; *P.J.* xvii. 1. Closely approaches the action of Nitro-Glycerine, but without its objectionable features.—*Pr.* '83, i. 179.

**B.P.Dose.**—2 to 5 grains.

**Antidotes.**—Emetics, fresh air, recumbent position, Ergot, and Atropine.

Used in preparing the pure Nitrites of Ethyl, Amyl, &c., by the Dunstan process.

Not Official.

**SODII OLEATIS SOLUTIO** (*see* p. 544).

## SODII ET POTASSII TARTRAS.

*See* SODA TARTARATA, p. 483.

## SODII PHOSPHAS.

PHOSPHATE OF SODIUM.

$Na_2HPO_4.\ 12H_2O$, eq. 358.

It may be obtained by adding a solution of Carbonate of Sodium to a solution of Acid Phosphate of Calcium, prepared from a mixture of bone-ash and Sulphuric Acid.

There are three Phosphates of Sodium, the ortho-, meta-, and pyro-phosphate. The Official is the ortho-phosphate.

In transparent, colourless, rhombic prisms, terminated by four converging planes, efflorescent, tasting like common salt.

**Solubility.**—1 in 6 of Water; dissolves in its own water of crystallisation below 212° F.; insoluble in Rectified Spirit.

**Tests.**—Its solution has a faintly alkaline reaction, it gives a yellow precipitate with Nitrate of Silver, the resulting fluid acquiring an acid reaction. Heated to dull redness it loses 63 per cent. of its weight, leaving a residue, which, when dissolved in Water, gives, with Chloride of Barium, a precipitate almost entirely soluble in Diluted Nitric Acid.

(Austr., Ger., Hung., Russ. and Swiss, Natrium Phosphoricum; Belg., Phosphas Sodæ; Dan., Dutch and Swed., Phosphas Natricus; Fr., Phosphate de Soude; Ital., Fosfato Bisodico; Port., Phosphato de Soda; Span., Fosfato Sodico; U.S.; not in Norw.)

**Medicinal Properties.**—A mild purgative; from its pure saline taste it is called tasteless Aperient Salt. Diuretic in small doses. As it renders the urine alkaline, it is sometimes useful in gout.

**Dose.**—¼ to 1 oz. Best given in gruel or weak broth.

Used in the preparation of Ferri Phosphas and Syrupus Ferri Phosphatis.

### Preparation.

### SODII PHOSPHAS EFFERVESCENS.

Phosphate of Sodium in crystals, 100; Bicarbonate of Sodium, 100; Tartaric Acid in powder, 54; Citric Acid in powder, 36. Dry the Phosphate of Sodium until it has lost rather more than half (60 per cent.) of its weight; powder the product and mix it with the other ingredients. Place the mixture in a dish or pan of suitable form heated to between 200° and 220° F. (93·3° and 104·4° C.); and when the particles of the powder begin to aggregate, stir them assiduously until they assume a granular form; then by means of suitable sieves, separate the granules of uniform and most convenient size, and preserve the preparation in well-closed bottles. The product should weigh about 200. =(1 in 2).

**Dose.**—¼ to ½ ounce.

## SODII SALICYLAS.

### SALICYLATE OF SODIUM.

$(NaC_7H_5O_3)_2, H_2O$, eq. 338.

Obtained by the action of Salicylic Acid on Carbonate of Sodium or on Caustic Soda.

It has been pointed out by Helbing that crystallised Salicylate of Sodium is anhydrous, so that in next edition of B.P. the $\frac{1}{2}H_2O$ should be deleted.

The remarks on the purity of Salicylic Acid, given p. 40, are even more applicable to Salicylate of Sodium, as it is in this form that Salicylic Acid is generally used for internal administration. The Acid liberated from the Sodium salt and recrystallised, should have the melting point and answer all the tests given on that page.

Small colourless or nearly colourless crystalline scales.

The B.P. should draw a distinction in colour between a Salicylate prepared with "Artificial" and one with "Natural" acid. The former should be *perfectly* colourless; the latter will be more or less yellow. Apart from the colour there is no marked difference between the two.

**Solubility.**—1 in 1 of Water; 1 in 5 of Rectified Spirit; 1 in 30 of Absolute Alcohol.

**Tests.**—Perchloride of Iron colours a concentrated solution reddish-brown, and a dilute solution violet. If the aqueous solution be acidulated* by Nitric Acid, and the precipitate be dissolved by Rectified Spirit, the mixture is not rendered more than faintly opalescent by Chloride of Barium or Nitrate of Silver (only traces of Sulphate and Chloride). It dissolves without coloration or effervescence in cold Sulphuric Acid.

(Austr., Ger., Hung., Russ. and Swiss, Natrium Salicylicum; Belg., Salicylas Sodæ; Dutch, Norw. and Swed., Salicylas Natricus; Fr., Salicylate de Soude; Ital., Salicilato di Sodio; Span., Salicilato Sodico; U.S.; not in the others.)

**Medicinal Properties.**—Given in acute and chronic rheumatism. A soluble form of Salicylic Acid, and is less irritating. Very useful in sciatica. The best antiseptic for fermentative dyspepsia.

In some forms of Diabetes.—*L.* '80, i. 627; *B.M.J.* '86, i. 737; *T.G.* '85, 446.

*It is a very powerful stimulant of the liver, but a very slight stimulant of the intestinal glands.—Dr. Rutherford.*

**Dose.**—10 to 30 grs. twice or thrice a day.

Rapidly colours yellow, brown, or red when mixed with alkalies.

It is sometimes prescribed with Citric Acid, which precipitates the Salicylic Acid. It is better to give it with Citrate of Sodium or Potassium. When prescribed with a salt of Quinine, Salicylate of Quinine is formed, which is only slightly soluble, and is therefore thrown out.

## SODII SULPHAS.

### SULPHATE OF SODIUM.

*B.P.Syn.*—Glauber's Salt.

$Na_2SO_4,10H_2O$, eq. 322.

This is obtained by purification of the crude "Salt-cake" resulting from the decomposition of Salt by Oil of Vitriol in the first stage of the alkali manufacture.

In colourless, transparent, oblique rhombic prisms; it effloresces on exposure to air.

100 Sulphate of Sodium exposed to heat in a crucible lose 55·9 of Water.

**Solubility.**—1 in 3 of Water, and measures 3½; 10 in 3 of Water at 92° F.; 10 in 4½ of Water at 212° F.; insoluble in Rectified Spirit.

**Tests.**—100 grains dissolved in Distilled Water acidulated with Hydrochloric Acid give, with Solution of Chloride of Barium, a white precipitate, which, when washed and dried, weighs 72·2 grains. Heated with Solution of Potash no odour of Ammonia is evolved, and no precipitate is formed.

(Austr. and Hung., Natrium Sulfuricum Crystallisatum, also Siccum; Belg., Sulphas Sodæ; Dan., Dutch, Norw., and Swed., Sulphas Natricus; Dan., also Siccatus; Dutch, also Exsiccatus; Fr., Sulfate de Soude Purifié; Ger. and Swiss, Natrium Sulfuricum, also Siccum; Ital., Solfato di Sodio; Port., Sulfato de Soda; Russ., Natrium Sulfuricum, Depuratum, Crudum, and Siccum; Span., Sulfato Sodico; U.S.)

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* The word "acidulated" should be "supersaturated," as sufficient Nitric Acid must be added to prevent the precipitation of Silver Salicylate over and above what is necessary to completely decompose the Salicylate of Sodium.

**Medicinal Properties.**—An excellent cooling aperient.

*A moderately powerful stimulant of the liver, and a powerful stimulant of the intestine.—Dr. Rutherford.*

**Dose.**—¼ to 1 oz.

### Preparation.

**SODII SULPHAS EFFERVESCENS.**

Sulphate of Sodium in crystals, 100; Bicarbonate of Sodium in powder, 100; Tartaric Acid in powder, 54; Citric Acid in powder, 36. Dry the Sulphate of Sodium until it has lost rather more than half (56 per cent.) of its weight; powder the product and mix it with the other ingredients. Place the mixture in a dish or pan of suitable form heated to between 200° and 220° F. (93·3 and 104·4° C.), and when the particles of the powder begin to aggregate stir them assiduously until they assume a granular form; then by means of suitable sieves, separate the granules of uniform and most convenient size, and preserve the preparation in well-closed bottles. The product should weigh about 200. =(1 in 2).

**Dose.**—¼ to ½ ounce.

### Not Official.

**PULVIS SODII SULPHATIS ET ZINGIBERIS.**—Sulphate of Sodium, powdered as finely as possible, 60 grs.; Ginger in powder, 5 grs.: mix.

To be taken in a small tumbler of warm Water, in the morning.

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## SODII SULPHIS.

### SULPHITE OF SODIUM.

**$Na_2SO_3$, $7H_2O$**, eq. 252.

Obtained by the action of Sulphurous Acid on Carbonate of Sodium or on Caustic Soda.

It crystallises in white transparent prisms, which effloresce when exposed to the air.

The early issues of B.P., 1885, gave it as "very soluble in Spirit," this was changed in the later reprints to "very sparingly soluble in Spirit." By next edition this will probably be found to be "insoluble in Spirit," or possibly omitted altogether.

**Solubility.**—3 in 4 of Water; insoluble in Rectified Spirit; 1 in 25 of Glycerine.

**Tests.**—The aqueous solution has a neutral or faintly alkaline reaction, which on the addition of Hydrochloric Acid evolves a Sulphurous vapour, but does not become cloudy—in this it differs from Hyposulphite, which deposits Sulphur.

(Port., Sulfito de Soda; U.S.; not in the others.)

**Medicinal Properties.**—Antiseptic; given with success in sarcina ventriculi.

**Dose.**—5 to 20 grs.

### Not Official.

**LIQUOR SODII SULPHITIS BENZOICUS.**—Sulphite of Sodium, 30; Benzoic Acid, 14; Water, 500.

An **Antiseptic solution,** recommended by Heckel.—*B.M.J.* '87, ii. 1355.

## SODII SULPHOCARBOLAS.

SULPHOCARBOLATE OF SODIUM.

$NaC_6H_5SO_4, 2H_2O$, eq. 232.

Obtained by dissolving Carbolic Acid in excess of Sulphuric Acid, supersaturating the liquid with Carbonate of Barium, and treating the filtrate with Carbonate of Sodium until no further precipitate forms, filtering and evaporating so as to obtain crystals.

Colourless, transparent, rhombic prisms. The solutions are neutral to Litmus.

The Sulphocarbolates used in Medicine are defined as the salts of Para-Phenol-Sulphonic Acid. The action of Sulphuric Acid upon Carbolic Acid results in a mixture of Para- and Ortho-Phenol-Sulphonic Acids, the proportion of the latter being less the higher the temperature, and the longer continued the contact. To eliminate the Ortho salt further purification is necessary.

The B.P. process can only be looked upon as the line to be followed, rather than instructions to be acted upon.

**Solubility.**—1 in 6 of Water; 1 in 150 of Rectified Spirit; 1 in 5½ of Glycerine.

**Tests.**—On ignition it gives vapours of Carbolic Acid and leaves a residue, the solution of which in Water affords a white precipitate with Chloride of Barium insoluble in Hydrochloric Acid. The dilute aqueous solution is rendered violet by solution of Perchloride of Iron; it should not at once be rendered turbid by Chloride of Barium.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Antiseptic; given in cases of flatulence.

**Dose.**—10 to 15 grs.

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Not Official.

## SODII TAUROCHOLAS.

Prepared from Ox-bile or Pig's-bile.

Has been given in the treatment of gout, in doses of 4 grains at each meal immediately after food. The **pills** should be coated with Keratin.—*L.* '85, i. 745, 917.

**Dose.**—2 to 6 grains, in **pill** with Proof Spirit.

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## SODII VALERIANAS.

VALERIANATE OF SODIUM.

$NaC_5H_9O_2$, eq. 124.

According to the process described in B.P., Amylic Alcohol is distilled with Bichromate of Potassium and Sulphuric Acid; the resulting distillate (Valerianic Acid) neutralised with Caustic Soda, the solution evaporated and the residue fused by heat.

In dry white masses without alkaline reaction; entirely soluble in Rectified Spirit.

**Solubility.**—1 in 2½ of Water; about 1 in 100 of Rectified Spirit.

**Dose.**—1 to 5 grs., in **pill** with Glucose.

(Not in the other Pharmacopœias.)

Used chiefly to prepare Valerianate of Zinc.

Not Official.

## SOZOIODOL.

IODOPARAPHENOLSULPHONIC ACID.

A white, shining, crystalline, odourless powder, containing Iodine 52 p.c., Carbolic Acid 20 p.c., and Sulphur 7 p.c., preferably used in the form of its salts. When required in solution, the Sodium salt is most applicable, dissolving 1 in 14 of Water or Glycerine. The Potassium salt, soluble 1 in 100 of Water, is preferable as a **dusting powder**, or in **ointments**. Solution of the Zinc salt, 1 to 3 p. c., is suitable for **injection.** The compound with Mercury is an orange-coloured powder.

**Medicinal Properties.**—It is introduced as a substitute for Iodoform.

It is recommended locally in nasal and pharyngeal disorders, and as an application of great energy in parasitic skin affections.—*B.M.J.* '89, ii. 42; *T.G.* '89, 132, and '91, 592.

**Sozoiodol cotton** and **gauze** containing 5 and 10 p.c.

Not Official.

## SPERMIN.

DR. BROWN-SEQUARD'S ORCHITIC FLUID.

Full details regarding its preparation and uses are published *B.M.J.* '93, i. 1145, 1212, with an editorial article p. 1279.

Some recent experiments, at the Hospital for the Paralysed and Epileptic, are given *L.* '94, i. 263.

## SPIRITUS.

SPIRIT.

All substances which have undergone the vinous fermentation, and in which it is not completely over, contain Alcohol ready formed, which is separated by distillation. The various kinds are distinguished by varieties of flavour and colour.

When Spirit is distilled with aromatic vegetables containing volatile oil, the oil rises for the most part with the spirituous vapour, and condenses along with it in a state of solution.

The Spirits of the British Pharmacopœia are as follows: the formulas will be found under the names of the drugs from which they are prepared:—

| Dose. | | | Proportion of ingredient. |
|---|---|---|---|
| 30 to 90 mins. | SPIRITUS ÆTHERIS | | 1 in 3. |
| 30 to 120 mins. | SPIRITUS ÆTHERIS COMPOSITUS. | | |
| ½ to 2 drms. | SPIRITUS ÆTHERIS NITROSI. | | |
| 30 to 60 mins. | SPIRITUS AMMONIÆ AROMATICUS. | | |
| 30 to 60 mins. | SPIRITUS AMMONIÆ FŒTIDUS. | | |
| 1 to 2 drms. | SPIRITUS ARMORACIÆ COMP. | | 1 in 8. |
| 30 to 60 mins. | SPIRITUS CAJUPUTI | (Oil) | 1 in 50. |
| 10 to 30 mins. | SPIRITUS CAMPHORÆ | | 1 in 10. |
| 20 to 60 mins. | SPIRITUS CHLOROFORMI | | 1 in 20. |
| 30 to 60 mins. | SPIRITUS CINNAMOMI | (Oil) | 1 in 50. |
| 30 to 60 mins. | SPIRITUS JUNIPERI | ,, | 1 in 50. |
| 30 to 60 mins. | SPIRITUS LAVANDULÆ | ,, | 1 in 50. |
| 30 to 60 mins. | SPIRITUS MENTHÆ PIPERITÆ | ,, | 1 in 50. |

| Dose. | | Proportion of ingredient. |
|---|---|---|
| 30 to 60 mins. . | SPIRITUS MYRISTICÆ . . . . (Oil) | 1 in 50. |
| | SPIRITUS RECTIFICATUS (88·76 p. c. of Alcohol by volume). | |
| 30 to 60 mins. . | SPIRITUS ROSMARINI . . . . (Oil) | 1 in 50. |
| | SPIRITUS TENUIOR (Rect. Sp. 5, Water 3). Sp. g. ·920. | |
| | SPIRITUS VINI GALLICI (48 to 56 p. c. Alcohol by volume). | |

## SPIRITUS ÆTHERIS NITROSI.

### SPIRIT OF NITROUS ÆTHER.

*B.P.Syn.*—Spiritus Ætheris Nitrici (*Lond.*, *Edin.*).

A spirituous solution containing nitrous compounds, aldehyd, and other substances.

Nitric Acid, 3; Sulphuric Acid, 2; Copper, in fine wire (No. 25), 2; Rectified Spirit, a sufficiency: to 20 of the Spirit add gradually the Sulphuric Acid, stirring them together; then add to this, also gradually, 2½ of the Nitric Acid. Put the mixture into a retort or other suitable apparatus, into which the Copper wire has been introduced, and to which a thermometer is fitted. Attach now an efficient condenser, and applying a gentle heat, let the Spirit distil at a temperature commencing at 170° F. (76·7° C.) and rising to 175° F. (79·4° C.) but not exceeding 180° F. (82·2° C.) until 12 have passed over and been collected in a bottle kept cool, if necessary, with ice-cold water; then withdraw the heat, and having allowed the contents of the retort to cool, introduce the remaining ½ of Nitric Acid, and resume the distillation as before, until the distilled product has been increased to 14. Mix this with 40 of the Rectified Spirit, or as much as will make the product correspond to the "Nitric Oxide Test." Preserve it in thoroughly well-closed vessels.

A transparent inflammable liquid. Sp. g. ·840—·845.

Nearly colourless, with a very slight tinge of yellow, with peculiar penetrating apple-like odour, and sweetish, cooling, sharp taste.

**Tests.**—It effervesces feebly or not at all when shaken with a little Bicarbonate of Sodium. When agitated in a test-tube, with strong solution of Sulphate of Iron, and if a few drops of Sulphuric Acid are then poured down the side of the tube, a deep olive-brown or black zone is produced. Tested as described in the *Pharmaceutical Journal*, 3rd series, vol. xiii. p. 63 (Eykman's test); or vol. xv. p. 101 (Dymond's modification of Eykman—both are processes for the measurement of the volume of Nitric Oxide given off when the Spirit of Nitrous Ether is heated with an acid solution of Ferrous Sulphate); or vol. xv. p. 673 (Allen's test), it should yield at the ordinary temperature 60° F., (15·5° C.) and pressure (30 inches or 760 millimetres of Mercury), and when freshly prepared, seven times its volume of Nitric Oxide gas; and even after it has been kept some time and the vessel containing it has occasionally been opened, it should yield not much less than five times its volume of the gas.

Allen's method consists in treating the sample with an acidulated solution of Iodide of Potassium, and measuring the Nitric Oxide liberated. Fill a nitrometer with strong brine, and then introduce 5 c.c. of the Spirit of Nitrous Ether; then allow 5 c.c. of a strong solution of Iodide of Potassium to enter, followed by 5 c.c. of Diluted Sulphuric Acid. Agitate briskly at intervals, after five minutes adjust the liquid in the two limbs of the nitrometer to the same level, and read off the volume of gas obtained. The British Pharmacopœia requires 35 c.c. or not much less than 25 c.c. from 5 c.c. of Spirit of Nitrous Ether.

To calculate the percentage of real Nitrite of Ethyl, the following data are required:—

1. The sp. g. of the sample examined.
2. 23·55 c.c. of Nitric Oxide, measured at *ordinary* pressure and temperature, weigh ·03 grm.
3. 30 parts by weight of Nitric Oxide are equivalent to 75 parts by weight of Nitrite of Ethyl.

The measure of gas evolved on the addition of Iodide of Potassium is a measure of the acidity of the Spiritus Ætheris Nitrosi under examination. It should not amount to much more than a third of the total gas volume registered.

Dymond (*P.J.* xix. 467) states, that Nitrite of Ethyl in Rectified Spirit decomposes from there being so much Water in it, and that this is likely to account for loss of strength on keeping. Our experience scarcely agrees with this. When evaporation is prevented, we do not find the loss to exceed 6 per cent. (32 c.c. of gas from 5 c.c. reduced to 30 c.c.) in a month, and believe evaporation to be the chief cause of deterioration.

(Belg., Æther Nitricus Alcoholicus, sp. g. ·850—·860; Swed., Æther Nitrosus Spirituosus, sp. g. ·840; Dutch, Nitris Æthylicus cum Spiritu, sp. g. ·840—·850; Fr., Acide Azotique Alcoolisé; Spiritus Ætheris Nitrosi, Ger. and Russ., sp. g. ·840—·850, Swiss, sp. g. ·845—·855, U.S. sp. g. ·836—·842; Ital., Etere Nitroso Officinale, sp. g. ·850; Port., Acido Azotico Alcoolisado; Span., Eter Nitroso Alcoholizado; not in the others.)

**Medicinal Properties.**—Stimulant, diaphoretic, and diuretic. Useful in dropsy and catarrh.

**Dose.**—$\frac{1}{2}$ to 2 drms.

**Incompatibles.**—Iodide of Potassium, Sulphate of Iron, Tincture of Guaiacum, Gallic and Tannic Acids. Emulsions are curdled by its addition.

When prescribed with Iodide of Potassium separation of Iodine may be prevented by neutralising the free acid in Spiritus Ætheris Nitrosi with Caustic Potash or the Carbonate.

### Not Official.

**ETHYL NITRITE.**—As it is to this compound that Spt. Ether. Nit. B.P. is supposed to owe its efficacy, it has been proposed (*P.J.* xviii. 861) to make a pure Ethyl Nitrite by the interaction of Sodium Nitrite, Sulphuric Acid and Alcohol, and to prepare from this a solution in Absolute Alcohol, corresponding to the strength indicated by the Official test, 5 p.c. of Glycerine being added as a preservative.

Experiments testing the physiological activity of the B.P. preparation compared with a 2·5 p.c. solution of the pure Ethyl Nitrite showed that both were practically identical.—*P.J.* xix. 490.

### Not Official.

## SPIRITUS FRUMENTI.

### WHISKY.

An alcoholic liquid obtained from fermented grain by distillation, and containing from 50 to 58 per cent. by volume of Alcohol. It should be not less than 2 years old. Sp. g. not above ·930 nor below ·917.

It has an amber colour, a distinctive odour and taste. If 100 c.c. be very slowly evaporated in a weighed capsule on a water-bath, the last portions volatilised should not have a harsh or disagreeable odour (absence of more than traces of Fousel Oil from grain or potato spirit). The residue fully dried at 212° F. (100° C.) should weigh not more than ·250 gramme, equivalent to ·25 per cent. (absence of undue amount of solids). This residue should have no sweet or distinctly spicy taste (absence of added Sugar, Glycerine, or Spices). It should nearly all dissolve in 10 c.c. of cold Water, forming a solution which is coloured light green by a dilute Solution of Ferric Chloride (traces of oak tannin from casks). 100 c.c. of Whisky should be rendered distinctly alkaline to Litmus by 1·2 c.c. of the volumetric Solution of Potash (absence of an undue amount of free acid).

## SPIRITUS RECTIFICATUS.

### RECTIFIED SPIRIT.

Alcohol, $C_2H_5HO$, eq. 46, with 16 per cent. (by weight) of Water; obtained by the distillation of fermented saccharine fluids.

It is possible to rectify Spirit up to 98 per cent. (minimum strength for B.P. Absolute Alcohol), and 95 per cent. is prepared commercially in large quantities.

It may here be noted that although it is illegal for a Pharmacist to sell Rectified Alcohol except upon prescription, the Board of Inland Revenue do not interfere with the sale by Chemists and Druggists to medical or scientific gentlemen, for the purposes of medical or scientific research, in small quantities not exceeding 8 ounces at a time.

Rectified Spirit dissolves Camphor, Balsams, Castor Oil, Iodine, Lithia, Mannite, Phosphorus, Potash (but not the Carbonate), Soda, Tannic and Gallic Acids.

When 18 measures of Rectified Spirit are mixed with 18 of Water, the mixture condenses into 35 measures.

**Tests.**—Sp. g. ·838. Burns with a blue flame without smoke. Remains clear when diluted with Distilled Water. Odour and Taste purely alcoholic. 4 ounces with 30 grain-measures of the volumetric solution of Nitrate of Silver, exposed for twenty-four hours to bright light and then decanted from the black powder which has formed, undergo no further change when again exposed to light with more of the test-solution (absence of Fousel Oil).

Rectified spirit is occasionally met with, which gives a yellow colour on the addition of Liquor Ammoniæ, generally reckoned to be due to the presence of Tannin.

(In all the Pharmacopœias, *see* tables p. 504.)

**Medicinal Properties.**—Internally a powerful diffusible stimulant. Used in some states of acute disease characterised by excessive debility. Externally, applied diluted to produce cold by evaporation; when evaporation is repressed, it acts as a stimulant. 1 of Rectified Spirit and 2 of Camphor Water mixed is a good evaporating **lotion.** Diluted, it forms a lotion for erysipelas, erythema, burns and scalds while the cuticle is entire, and for sprains and recent bruises.

*Pure diluted spirit does not affect the biliary secretion.—Dr. Rutherford.*

## Preparations.

**SPIRITUS TENUIOR.** Proof Spirit.*

Rectified Spirit, 5; Distilled Water, 3: mix.

Sp. g. ·920.

It contains by weight about 49 per cent. and by volume about 57 per cent. of Absolute Alcohol.

**SPIRITUS VINI GALLICI.** French Brandy.

Spirit distilled from French wine. It has a characteristic flavour, and a light sherry colour derived from the cask in which it has been kept.

Sp. g. ·941. 100 parts contain 48 to 56 parts of Alcohol (by volume).

**MISTURA SPIRITUS VINI GALLICI.**

French Brandy, 4 oz.; Cinnamon Water, 4 oz.; the Yolks of 2 Eggs; Sugar, ½ oz.: rub the Yolks and Sugar together, then add the Cinnamon Water and Brandy.

**Dose.**—1 to 2 oz.

Stimulant, restorative in cases of prostration or last stages of fever.

The Spirits of the Pharmacopœias are as follows:—

| | Sp. g. | Percentage of Absolute Alcohol by Measure. | |
|---|---|---|---|
| British | ·838 | Spiritus Rectificatus | 88·76 † |
| ,, | ·920 | ,, Tenuior | 57 |
| Austrian | ·830—·834 | Sp. Vini Concentratus | 90 to 91 |
| ,, | ·894—·896 | ,, Dilutus | 68 to 70 |
| ,, | ·920—·925 | ,, Cognac. (by weight) | 45 to 50 |
| Belgian | ·794 | Alcohol Anhydrus | 100 |
| ,, | ·8276 | ,, at 92° | 92 |
| Danish | ·830—·834 | Spiritus Concentratus | 90 to 91 |
| ,, | ·893—·895 | ,, Dilutus | 68 to 69 |
| ,, | ·940—·942 | ,, Tenuis | 46 to 47 |
| Dutch | ·831—·837 | ,, Fortior | 89 to 91 |
| ,, | ·887—·892 | ,, Dilutus | 69 to 74 |
| French | ·816 | Alcohol at 95° | 95 |
| German | ·830—·834 | Spiritus | 90 to 91 |
| ,, | ·892—·896 | ,, Dilutus | 68 to 69 |
| ,, | ·920—·924 | ,, e Vino. (by weight) | 46 to 50 |
| Hungarian | ·831—·834 | Spiritus | 90 to 91 |
| ,, | ·892 | ,, Dilutus | 70 |
| ,, | ·919—·924 | Cognac (by weight) | 46 to 50 |

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* When the sp. g. is ·920 it is called proof; if lighter than this, it is called above proof; if heavier than this, under proof; and the percentage of Water, or of Rectified Spirit, sp. g. ·825 (the Inland Revenue standard), by measure, necessary to be added to any sample of spirit to bring it to the standard of Proof Spirit, indicates the number of degrees the given sample is above or below proof. Thus, if 100 volumes of a Spirit require 10 volumes of Water to reduce it to proof, it is said to be "10 over proof"; on the other hand, if 100 volumes of Spirit require 10 volumes of Spirit to raise it to proof, the sample is said to be "10 under proof."

† This strength is sometimes called "Trois-six" ($\frac{3}{6}$ths), because it requires $\frac{3}{6}$ths or half its volume of water to reduce it to Eau de Vie at 56° p. c. = Proof Spirit.

| | Sp. g. | | Percentage of Absolute Alcohol by Measure. |
|---|---|---|---|
| Italian | ·8344 | Alcool | 90 |
| ,, | ·79367 | ,, Absoluto | 96 |
| ,, | ·9139 | ,, Diluito | 60 |
| Norwegian | ·8311—·8344 | Spiritus Concentratus | 90 to 91 |
| ,, | ·9026—·9049 | ,, Dilutus | 64 to 65 |
| ,, | ·9348 | ,, Tenuis | 50 |
| Portuguese | ·834 | Alcool at 90° | 90 |
| ,, | ·850 | ,, 85° | 85 |
| ,, | ·905 | ,, 65° | 65 |
| Russian | ·813— ·816 | Sp. Vini Alkoholisatus | 95 |
| ,, | ·831— ·834 | ,, Rectificatissimus | 90 |
| ,, | ·888— ·890 | ,, Rectificatus | 70 |
| ,, | ·952— ·955 | ,, Dilutus | 38 |
| Spanish | | Alcohol Anhidro | 100 |
| ,, | | ,, de 90° | 90 |
| ,, | | ,, de 60° | 60 |
| Swedish | ·830— ·834 | Spiritus Concentratus | 90 to 91 |
| ,, | ·901— ·905 | ,, Dilutus | 64 to 65 |
| ,, | ·935 | ,, Tenuis | 50 |
| Swiss | ·812— ·816 | Spiritus | 95 to 96 |
| ,, | ·890— ·892 | ,, Dilutus | 69 to 70 |
| ,, | | ,, e Saccharo (Rum) | 50 to 60 |
| ,, | | ,, e Vino (Cognac) | 50 to 60 |
| U.S.A. | ·820 | Alcohol | 94 |
| ,, | ·797 | ,, Absolutum . (by weight) | 99 |
| ,, | ·816 | ,, Deodoratum. | 95 |
| ,, | ·936 | ,, Dilutum | 48·6 |
| ,, | ·925— ·941 | Sp. Vini Gallici | 46 to 55 |
| ,, | ·917— ·930 | ,, Frumenti | 50 to 58 |

*Table of the Amount of absolute Alcohol by weight, or Proof-spirit (Brandy) by volume, in the following Wines, &c., from Dr. Christison's Experiments in* 1838.

| | Alc. by weight | Proof-sp. by vol. |
|---|---|---|
| | in 100 parts. | |
| Port, weakest | 14·97 | 30·56 |
| ,, mean of 7 wines | 16·20 | 33·91 |
| ,, strongest | 17·10 | 37·27 |
| White Port | 14·97 | 31·31 |
| Sherry, strongest | 16·17 | 35·12 |
| ,, mean of 9 wines long in cask in E. Indies | 14·72 | 32·30 |
| ,, Madre da Xeres | 16·90 | 37·06 |
| Madeira, long in cask in the East Indies | 14·09 | 30·80 |
| ,, strongest | 16·90 | 37·00 |
| Teneriffe, long in cask at Calcutta | 13·84 | 30·21 |

| | Alc. by weight | Proof-sp. by vol. |
|---|---|---|
| | in 100 parts. | |
| Sercial | 15·45 | 33·65 |
| Dry Lisbon | 16·14 | 34·71 |
| Shiraz | 12·95 | 28·30 |
| Amontillado | 12·63 | 27·60 |
| Sherry, weakest | 13·98 | 30·84 |
| ,, mean of 13 wines not long in cask | 15·37 | 33·59 |
| Claret, 1st growth, 1811 | 7·72 | 16·95 |
| Château - Latour, Do. 1825 | 7·78 | 17·06 |
| Rausan, 2nd growth, 1825 | 7·61 | 16·74 |
| Vin Ordinaire, Bordeaux | 8·99 | 18·96 |
| Rives Altes | 9·31 | 22·35 |
| Malmsey | 12·86 | 28·37 |

| | Alc. by weight | Proof-sp. by vol. |
|---|---|---|
| | in 100 parts. | |
| Rudesheimer, first quality | 8·40 | 18·44 |
| ,, inferior | 6·90 | 15·19 |
| Hambacher, 1st qual. | 7·35 | 16·15 |

| | Alc. by weight | Proof-sp. by vol. |
|---|---|---|
| | in 100 parts. | |
| Edinb. ale, unbottled . | 5·70 | 12·60 |
| ,, 2 yrs. bot. | 6·06 | 13·40 |
| London porter, four months in bottle. . | 5·36 | 11·91 |

The alcohol of most true wines is derived solely from the fermentation of the sugar, or alteration of the acids contained in the grape-juice from which they are produced. In others the proportion is increased by adding starch-sugar before or during fermentation. In others, again, it is added directly in the form of Brandy, partly to please the palate of consumers, partly because it is thought necessary to make the wine keep well. The strong wines commonly used in Britain, such as Port, Sherry, and the like, are almost all strengthened in this manner, and frequently also the inferior sorts of Bordeaux wine.

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Not Official.

## SPIRITUS METHYLATUS.

### METHYLATED SPIRIT.

The duty-free Spirit supplied to "manufacturers" under a special bond, is a mixture of 9 parts of Alcohol with 1 part of a Wood Naphtha, approved by the Excise. It can also be supplied under a special bond for scientific purposes.

As supplied to "licensed retailers" Methylated Spirit is, three pints of Petroleum Oil added to 100 gallons of the mixture described above. The Petroleum Oil is added, partly to make it more nauseous for drinking, and partly to facilitate its recognition. It becomes turbid when mixed with Water, which quality renders it unsuitable for many purposes to which duty-free Spirit has been applied.

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Not Official.

## STANNI OLEAS.

A greyish coarsely granular powder, insoluble in Alcohol, very slightly soluble in Almond Oil, completely disintegrated and partially dissolved by Ether or Oleic Acid.

**UNGUENTUM STANNI OLEATIS.**—Oleate of Tin, 60 grs.; Lard, 1 oz.

Of great utility in diseases of the nails; it overcomes the brittle, split, and soft conditions of the nails, and gives them a brilliant lustre.—*B.M.J.* '84, ii. 753; *T.G.* '86, 494.

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## STAPHISAGRIÆ SEMINA.

### STAVESACRE SEEDS.

The dried ripe seeds of *Delphinium Staphisagria.*

Four samples of seeds yielded (by extraction with Ether) 31·4, 32·8, 33·9, and 34·8 per cent. of Oil.

(Belg., Semen Staphysagriæ; Fr., Staphisaigre; Ital., Stafisagria; Port., Paparraz; Span. Estafisagria; U.S., Staphisagria; not in the others.)

**Medicinal Properties.**—The seeds have been used in ointments for many years as a parasiticide, but it has been discovered that the activity rests in an Oil which they contain in rather large quantity.

Mr. Balmanno Squire experimented with this Oil, and also with the Seeds from which the Oil had been withdrawn by Ether, and found the latter inert.

### Preparation.

**UNGUENTUM STAPHISAGRIÆ.**

Stavesacre Seeds, 1; Benzoated Lard, 2: crush the Seeds and macerate them in the Lard kept melted on a water-bath for two hours. Strain through calico, and set aside to cool.

*B.P.*—It contains about 10 per cent. of the Oil of Stavesacre.

(Ital., 1 and 3; not in the other Pharmacopœias.)

### Not Official.

**DELPHININA.**—An amorphous yellowish alkaloid of resinous appearance, obtained from Stavesacre. Insoluble in Water, but dissolves in Acidulated Water, in Alcohol, Ether, and Chloroform.

**Dose.**—$\frac{1}{60}$ grain, and repeat every two hours in neuralgia.—*L.M.R.* '87, 446. *L.* '87, ii. 879.

**OLEUM STAPHISAGRIÆ.**—The Oil obtained by expression from the Seeds.

It is insoluble in Rectified Spirit, but dissolves readily in hot Absolute Alcohol.

**UNGUENTUM OLEI STAPHISAGRIÆ.**—Expressed Oil, 60 mins.; Lard, 1 oz. Used as a non-irritant remedy in scabies and in phtheiriasis.—*B.S.H.*

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### Not Official.

## STEARINE.

COCOA-NUT STEARINE.

This substance, which melts at about 84° F., is much better for the manufacture of **suppositories** (especially in the cooler months of the year) than Oil of Theobroma; the melting point of the latter is so near the temperature of the body, that the suppositories made with it frequently require a very long time to melt. Mixtures of Stearine and Theobroma Oil give intermediate figures.

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## STRAMONII FOLIA.

STRAMONIUM LEAVES.

The dried leaves of *Datura Stramonium.*

Official in the British Pharmacopœias of 1864 and 1867, omitted in 1885, and re-introduced into "Additions" 1890.

As stated in the "Companion," 1864 and all subsequent editions, it is much used for asthma, in the form of **cigarettes** and **smoking mixtures.**

(Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Norw., Russ., Span., Swed., Swiss and U.S.; not in Hung. or Port.)

### Not Official.

**PULVIS STRAMONII COMPOSITUS.**—Stramonium, Datura Tatula, Cannabis Indica, and Lobelia Inflata, all in powder, of each 6 drms.; Nitre in powder, 1 oz.; Eucalyptus Oil, 30 mins.; mix thoroughly.

It burns well, gives off dense fumes, and affords great relief during asthmatic attacks.—*B.M.J.* '84, ii. 465; '87, ii. 494.

# STRAMONII SEMINA.

## STRAMONIUM SEEDS.

The dried ripe seeds of *Datura Stramonium.*

The mixed alkaloids of Stramonium are generally called **Daturine**, but are the same as contained in Belladonna, viz., a mixture of Hyoscyamine and Atropine.

Total alkaloids found in Stramonium Seeds, ·17—·5 per cent. (average of fifteen samples ·35 per cent.) ; in Leaves ·32—·47 per cent. (average of eleven samples ·38 per cent.). *C.D.* '92, ii. 401. *See* also below under the Tincture.

(Belg., Fr., Port. (Estramonio), Swed., Swiss and U.S. ; not in the others.)

**Medicinal Properties.**—Antispasmodic and sedative to the respiratory organs. The Extract and the Tincture are used in convulsive coughs as anti-spasmodics. The Extract given with success for hay asthma. Like Belladonna, it causes dilatation of the pupil.

An **Ointment** of the fresh leaves relieves painful Cancer.

### Preparations.

### EXTRACTUM STRAMONII.

Pack Stramonium Seeds, in No. 40 powder, in a percolator, and pass about their own weight of Washed Ether slowly through them, remove the Ether and set aside; now pour over them Proof Spirit until the Seeds are exhausted. Distil off the Spirit, and evaporate the residue by a water-bath to a proper consistence for forming pills.

Proposed that the exhaustion with Ether be omitted, only traces of fixed oil being removed by the Proof Spirit, and the alkaloidal value the same in either case.—*P.J.* xx. 246.

**Dose.**—¼ gr., gradually increasing.

(Belg., from **fresh leaves**; Fr., clarified juice of **fresh leaves** evaporated, also alcoholic from **seeds**; Port., aqueous from **dried plant**, and clarified juice from **fresh leaves** ; Span., expressed juice of **leaves** clarified and evaporated, also aqueous from **dried leaves** and alcoholic from **dried leaves** ; Swiss, with diluted alcohol, 1 = 2 of **Seeds**, also **Fluid Extract** 1 in 1 ; U.S., alcoholic from **seeds**, also **Fluid Extract** from **seeds**.)

### TINCTURA STRAMONII.

Stramonium Seeds, bruised, 1 ; Proof Spirit, 8 : macerate forty-eight hours with 6 of the Spirit, agitating occasionally ; pack in a percolator, let it drain, and pour on the remaining Spirit. When it ceases to drop, press, filter, and add Proof Spirit to make 8. =(1 in 8).

**Dose.**—10 to 30 minims.

The experiments of Wright and Farr, *P.J.* xxii., 569, show a much lower average (·2 per cent.) than quoted above ; they recommend a tincture made from the leaves with 50 per cent. (by volume) Alcohol, and standardised to ·025 per cent.

(Belg. and Fr., **dried leaves** 1 and 5, also Alcoolature with **fresh leaves** and Spirit equal parts ; Port., **dried leaves** 1 and 5, **fresh leaves** 1 and 1, **seeds** 1 and 5 ; Swed., **seeds** 1 and 10 ; U.S., **seeds** 15 in 100 ; not in the others ; all by weight except U.S.)

**Incompatibles.**—The Mineral Acids, Caustic Alkalies.

**Antidotes.**—Same as for poisoning with Belladonna, page 124 ; also Morphine subcutaneously, and Chloroform Inhalation.

Not Official.

**GUTTÆ DATURINÆ.**—Sulphate of Daturine, 2 grs.; Water, 1 oz.—*L.O.H.* and *London Hospital.*

**UNGUENTUM DATURINÆ.**—Daturine, 4 grs.; Vaseline, 1 oz.—*London* and *Guy's.*

Not Official.

## STRONTII BROMIDUM.

In colourless crystals.

**Solubility.**—2 in 1 of water; 1 in 3 Rectified Spirit.

**Medicinal Properties.**—Recommended in chronic gastritis and dilated stomach, in doses of 30 grs. thrice daily; also the same doses in epilepsy.—*L.* '92, i. 47; '93, ii. 46; *B.M.J.* '92, ii. 1286; *T.G.* '91, 830, and '92, 120.

It has an unpleasant metallic taste.

**LACTATE OF STRONTIUM.**—A white granular powder, soluble 1 in 3 of Water, has been recommended for albuminuria in parenchymatous nephritis.—*L.* '92, i. 47.

## STROPHANTHUS.

STROPHANTHUS.

The ripe seeds of *Strophanthus hispidus,* freed from the awns.

This includes the green Kombé and other commercial varieties.—*P.J.* xix. 660. The active principle is a glucoside, **Strophanthin.**

(Austr., Dan., Ger., Ital., Russ., Swiss and U.S.; not in the others.)

**Medicinal Properties.**—A cardiac tonic, similar to Digitalis.

References.—*B.M.J.* '85, ii. 904; '89, i. 603; *L.* '87, ii. 202; *P.J.* xx. 328.

### Preparation.

**TINCTURA STROPHANTHI.**

Strophanthus reduced to No. 30 powder, and dried at 110° F. (43·3° C.), 1; pack in a percolator, and moisten it with Pure Ether. Macerate for 24 hours, then allow percolation to proceed, continuing the addition of the Ether until the fluid passes through colourless. Remove the marc from the percolator, and dry it, gradually heating it to 120° F. (48·9° C.). Again reduce it to powder, repack in the percolator, and moisten with Rectified Spirit; macerate for 48 hours, then pour on successive quantities of Spirit until 10 of percolate is obtained. Dilute with Rectified Spirit to 20. =(1 in 20).

The "Additions" authorises also the use of "commercial Ether" free from Alcohol and Water. *See* Æther Methylatus, p. 57.

**Dose.**—2 to 10 mins.

(Austr., Ital. and U.S., 1 in 20; Dan., Ger., Russ. and Swiss, 1 in 10; all by weight except U.S.; not in the others.)

Not Official.

**STROPHANTHIN.**—Colourless, opaque, brittle, and minutely crystalline.

Recommended as a heart tonic.—*L.* '90, ii. 415; *Pr.* xlv. 130.

**Solubility.**—Freely in Water and Rectified Spirit; practically insoluble in Chloroform, Ether, and Bisulphide of Carbon.

**Dose.**—$\frac{1}{300}$ to $\frac{1}{200}$ grain.

# STRYCHNINA.

## STRYCHNINE.

An Alkaloid $C_{21}H_{22}N_2O_2$, eq. 334; obtained from Nux Vomica. In right square octahedrons or prisms, colourless and inodorous.

**Solubility.**—1 in 6,000 to 8,000 of Water; 1 in 160 of Rectified Spirit; about 1 in 400 of Proof Spirit; 1 in 350 of Absolute Alcohol; 1 in 6 of Chloroform; nearly insoluble in Ether.

**Tests.**—It is not coloured by Nitric Acid (absence of Brucia). Leaves no ash when burned with free access of air. Pure Sulphuric Acid forms with it a colourless solution, which on the addition of Bichromate of Potassium acquires an intensely violet hue, speedily passing through red to yellow.

(Belg., Fr., Ital. (Stricnina), Port. (Estrychnina), Span. (Estricnina), Swed., and U.S.; not in the others. Fr., Ital. and Swed. have also the Nitrate; Austr., Dan., Dutch, Ger., Hung., Norw., Russ. and Swiss have the Nitrate only; Belg., Fr., Port., Span., Swiss and U.S. have also the Sulphate.)

**Medicinal Properties.**—Similar to those of Nux Vomica; useful in the treatment of paralysis, especially in cases of lead-poisoning. Small doses have been given with advantage in epilepsy. Recommended in chronic alcoholism. It is a very active poison.

**B.P.Dose.**—$\frac{1}{30}$ to $\frac{1}{12}$ of a grain.

Divide by trituration with Sugar of Milk before making into pills.

### Preparation.

**LIQUOR STRYCHNINÆ HYDROCHLORATIS.** *B.P.Syn.*—Liquor Strychniæ.

Strychnine, in crystals, 9 grs.; Diluted Hydrochloric Acid, 14 minims; Rectified Spirit, 4 drms.; Distilled Water, 12 drms.; mix the Hydrochloric Acid with 4 drachms of the Water, and dissolve the Strychnine in it by means of heat; then add the Spirit and the remainder of the Water. =(1 in 100).

The later reprints of B.P. have added "the solution should not be kept in a cold place."

108 minims contain 1 grain of Strychnine.

The strength has been increased slightly to make 1 grain in 100 grain-measures.

**Dose.**—4 to 10 minims = $\frac{1}{30}$ to $\frac{1}{12}$ gr. Strychnine.

2 minims subcutaneously injected for paralysis.

(Port., *Tinctura* de Estrychnina 1 in 100; not in the others.)

**Antidotes.**—Chloroform, Belladonna, Tinct. Aconite, Morphine, Tobacco, Hydrate of Chloral in 1 drachm doses.

Animal Charcoal or Tannic Acid, followed by an emetic, or the stomach-pump. Bromide of Potassium, in $\frac{1}{2}$ oz. dose in water, with 30 grs. of Chloral. 2 drms. of the Bromide, with or without 10 grs. of Chloral, may be given every 15 or 20 minutes if necessary. Nitrite of Amyl inhalations, the Amyl being poured freely on a handkerchief and held close to the nose. The patient may be kept fully under Chloroform or Ether. Curare, $\frac{1}{3}$ grain, by hypodermic injection. *Artificial respiration if possible.—Murrell.*

A case of recovery after taking 3 grs. of Strychnine.—*L.* '67, ii. 41, 118.

8 grains of Morphine said to be an antidote for 1 gr. of Strychnine.—*L.*'71, ii. 840.

## STYRAX PRÆPARATUS.

### PREPARED STORAX.

A balsam prepared from the inner bark of *Liquidambar orientalis*; purified by solution in Rectified Spirit, filtration, and evaporation.

A semi-transparent brownish-yellow semi-fluid balsam about the consistence of thick honey, with a strong agreeable odour and balsamic taste.

Heated in a test-tube on the vapour-bath it becomes more liquid, but gives off no moisture; boiled with solution of Bichromate of Potassium and Sulphuric Acid, it evolves an odour resembling that of Essential Oil of Bitter Almonds.

(Austr., Belg., Dutch, Ger., Hung., Russ. and Swiss, Styrax Liquidus; Dan., Norw. and Swed, Balsamum Styrax Liquidus; Fr., Styrax Liquide; Ital., Storace Liquido; Port. and Span., Estoraque Liquido; U.S., Styrax.)

**Medicinal Properties.**—Stimulant and expectorant. Similar in action to the Balsams of Peru and Tolu. Recommended also in gonorrhœa and leucorrhœa; said to be equal to Copaiba, and less disagreeable.

**Dose.**—10 to 20 grs. twice a day, gradually increasing.

Contained in Tinctura Benzoini Comp.

### Not Official.

**UNGUENTUM STYRACIS** (*B.S.H.*).—Prepared Storax, 2 fl. drms.; Prepared Lard, 1 oz.; mix.

Used in scabies.

## SUCCI.

### JUICES.

Juices expressed from fresh medicinal plants, and preserved by the addition of Spirit, were introduced by the Author in 1835 (*Pharm. Journ.* vol. i.). By thus preserving the juice of the plant, its properties are not impaired by the action of air during the time necessary to dry the leaf for Tincture, nor by the action of both air and heat during the time necessary to evaporate the juice to the consistence of an Extract.

They were found in practice superior to the Tinctures, and have been since employed, especially by medical men in private practice, to the present time.

The following are the Juices of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

| | |
|---|---|
| SUCCUS BELLADONNÆ . . . | Dose, 5 to 15 mins. |
| SUCCUS CONII . . . . . . . | „ ½ to 1 drm. |
| SUCCUS HYOSCYAMI . . . . | „ ½ to 1 drm. |
| SUCCUS SCOPARII . . . . . | „ 1 to 2 drms |
| SUCCUS TARAXACI. . . . . | „ 1 to 2 drms. |

These consist of 3 parts of Juice and 1 of Rectified Spirit.

Juices which are not official are enumerated in the Index.

The Alcoolatures of the Fr. are made by digesting equal weights of fresh plant and Rectified Spirit together for 10 days; press and filter. Aconite, Belladonna, Conium (Ciguë), Digitalis, Eucalyptus, Henbane (Jusquiame), Stramonium Leaves, Flowers of Colchicum, and Bulb of Colchicum, are so prepared.

Not Official.

## SUCCINUM.

AMBER.

A fossil resinous exudation from *Pinites succinifer*, an extinct coniferous tree, on the shores of the Baltic.

Hard and brittle, yellow or yellowish-red.

(Belg., Dutch, Fr. (Succin), Port. (Ambar), Span. (Sucino), and Swed.)

### Preparations.

**OLEUM SUCCINI RECT.**—A volatile Oil obtained by the destructive distillation of Amber, and purified by subsequent rectification.

**Dose.**—1 to 3 minims on Sugar.

Externally it is stimulant and rubefacient.

(Belg. and Hung., Ol. Succini Rect.; Dan. and Swed., Pyroleum Succini, Crude and Rect.; Norw., Pyroleum Succini Rect.; Port., Oleo de Ambar; Span., Aceite Pirogenado de Sucino.)

**LINIMENTUM SUCCINI.**—Oil of Amber, 1; Spirit of Camphor, 1; Spirit of Hartshorn, 1: mix.

A domestic **embrocation** for Whooping Cough.

**TINCTURA SUCCINI.**—Amber, in fine powder, 1; Rectified Spirit, 16. Digest 7 days.

**Dose.**—25 minims in Water for headache.

(Dutch, 1 Amber and 5; Fr., Succin, 1; Alcohol (80°), 10; Port., Tinctura de Ambar Composta, 2·8 Oil in 10; Swed., 1 Amber in 5; not in the others.)

## SULPHONAL.

SULPHONAL.

$C_7H_{16}S_2O_4$., eq. 228.

*Syn.*—DIETHYLSULPHON-DIMETHYL-METHANE.

In the preparation of this body, Mercaptan (Ethyl Hydrosulphide) is combined with Acetone to form Mercaptol, which, by oxidation with Potassium Permanganate, yields Sulphonal.

Colourless, inodorous, nearly tasteless, crystals.

It is now generally supplied in *powder*; its action is stated to be quicker and more certain in that form than when administered in crystals.

**Solubility.**—1 in 500 of Water; 1 in 15 of boiling Water; 1 in 78 of Rectified Spirit; 1 in 3 of Chloroform; 1 in 90 of Ether.

**Tests.**—Neutral to test paper. Melts at 258° F. (125·5° C.). Ignited with free access of air, it burns without residue. If a mixture of a few grains with an equal weight of Cyanide of Potassium be heated, the odour of Mercaptan is evolved, and when to the solution of the product in Water excess of Hydrochloric Acid and a few drops of Solution of Perchloride of Iron are added, a reddish colour is developed (due to the formation of Sulphocyanide).

(Dan., Ger., Russ. and Swiss, Sulfonalum; Ital., Solfonale; not in the others.)

**Medicinal Properties.**—Hypnotic. It produces no secondary evil effects under usual circumstances, but cases have been reported where poisonous symptoms have been produced in lunatics and in heart disease.

*B.M.J.* '88, i. 864; '88, ii. 31, 1450, 1454; '89, i. 952; '89, ii. 689, 817; '90, i. 710; and '90, ii. 237; *L.* '89, ii. 1051—1054; '90, i. 619; '91, i. 447, 787; *P.J.* xviii. 901, 1005; *C.D.* '88, i. 785.

**B.P.Dose.**—15 to 40 grains.

It is given suspended in Water with Compound Tragacanth Powder, 90 grs. to 6 ounces of Water; or in **powders,** one to be taken in hot water; or in **cachets.**

Not Official.

## SULPHUR.

SULPHUR.

S, eq. 32.

Sulphur occurs native, and is found in masses or in the powdery form mixed with various impurities. It is abundant in volcanic countries, as in Sicily, Naples, and the Roman States. It exists in this country in combination with Iron and Lead. It readily volatilises, and when the vapours are passed into a large brick chamber kept cold, it condenses in fine powder (Sublimed Sulphur), but when a small chamber is used and kept at a temperature about 120° C., it condenses in the liquid form and is run into moulds (Roll Sulphur).

(Belg., Sulphur Venale; Fr., Soufre; Ital., Solfo; Port., Enxofre; Span., Azufre; Swed.; not in the others.)

## SULPHUR PRÆCIPITATUM.

PRECIPITATED SULPHUR.

Prepared by precipitating with Hydrochloric Acid, a solution of Sulphide and Hyposulphite of Calcium obtained by boiling Slaked Lime and Sublimed Sulphur.

A greyish-yellow soft powder, free from grittiness, and from the smell of Sulphuretted Hydrogen. When heated in an open vessel, it burns with a blue flame and the evolution of Sulphurous Acid gas.

**Test.**—Entirely volatilised by heat. Under the microscope it is seen to consist of opaque globules without any admixture of crystalline matter; otherwise corresponds with Sublimed Sulphur.

The best test is that it should dissolve readily and completely in Bisulphide of Carbon.

Lac Sulphuris of former Pharmacopœias contained a large amount of Sulphate of Lime, owing to Sulphuric Acid being used in its preparation, but as Hydrochloric Acid is now employed, no distinction should be made between Milk of Sulphur and Precipitated Sulphur.

(In all the Pharmacopœias; Fr., Soufre Précipité; Ital., Solfo Precipitato; Port., Enxofre Precipitado; Span., Azufre Precipitado.)

**Medicinal Properties.**—Similar to those of Sulphur Sublimatum, only more active. Mixed with Milk and rubbed till smooth, children take it readily.

**Dose.**—20 to 60 grs.

### Preparation.

**TROCHISCI SULPHURIS.**

Precipitated Sulphur, 3600 grs.; Acid Tartrate of Potassium, 720 grs.; Refined Sugar in powder, 5760 grs.; Gum Acacia in powder, 720 grs.; Tincture of Orange Peel, 720 mins.; Mucilage of Acacia, 720 mins.; mix the Tincture of Orange with the powders, and add the Mucilage to form a suitable mass. Divide into 720 lozenges, and dry them in a hot-air chamber at a moderate temperature.

Each lozenge contains 5 grains of Sulphur.

**Dose.**—1 to 6 lozenges.

### Not Official.

**LOTIO SULPHURIS.**—Precipitated Sulphur, ½ oz.; Glycerine, 120 mins.; Rectified Spirit, 1 oz.; Rose Water, 3 oz.; Lime Water, 3 oz.

Recommended in acne of the face.—*L.* '87, i. 66.

**TROCHISCI SULPHURIS COMP.**—Each lozenge contains 5 grs. of Precipitated Sulphur, and 1 gr. of Cream of Tartar.

These lozenges differ from the Official Sulphur lozenge in that they contain no Orange, and are preferred by many persons.

A convenient form of administering Sulphur as a general laxative, in cases of sluggish liver, bleeding piles, and habitual constipation.—*L.* '89, i. 665.

**UNGUENTUM SULPHURIS PRÆCIPITATI.**—Precipitated Sulphur, 2; Carbonate of Potassium, 1; Lard, 8: mix.

Excellent for scabies.

## SULPHUR SUBLIMATUM.

### SUBLIMED SULPHUR.

A slightly gritty powder of a fine greenish-yellow colour; without taste and without odour until heated.

**Tests.**—Entirely volatilised by heat. Does not redden moistened Litmus paper. Solution of Ammonia, agitated with it and filtered, does not on evaporation leave any residue.

The B.P. test of freedom from acidity can only be expected from "**washed Sulphur,**" which is Official in most foreign Pharmacopœias. Commercial Sublimed Sulphur is always more or less acid.

**Solubility.**—Insoluble in water. Soluble in Oils and Turpentine with heat. Slightly soluble in hot Alcohol. Only partially soluble in Bisulphide of Carbon.

(In all the Pharmacopœias; Austr. has also Sulphur Depuratum; Belg. Sulphur Depuratum; Dan., Ger., Hung., Ital., Russ., Swed. and Swiss, Crude and Washed; Dutch, Sulfur Depuratum; Fr., Soufre Sublimé, also S.S. Lavé; Norw.; Port., Enxofre Sublimado; Span., Azufre Sublimado.)

**Medicinal Properties.**—Laxative. Employed internally in hæmorrhoidal affections and chronic rheumatism; externally for skin diseases, especially scabies.

**Dose.**—20 to 60 grs. in treacle or milk.

Used in the preparation of Antimonium Sulphuratum, Emplastrum Ammoniaci cum Hydrargyro, Emplastrum Hydrargyri, Pulv. Glycyrrhizæ Compositus, Potassa Sulphurata, Sulphuris Iodidum and Sulphur Præcipitatum.

### Preparations.

**CONFECTIO SULPHURIS.**

Sublimed Sulphur, 4 oz.; Acid Tartrate of Potassium, 1 oz.; Syrup of Orange Peel, 4 oz.; Tragacanth, in powder, 18 grs.: rub well together. =(1 in 2¼).

Tragacanth is added to give it a better consistence, and Glycerine might be added to keep the moisture uniform.

**Dose.**—60 to 120 grs.

(Not in the other Pharmacopœias.)

**UNGUENTUM SULPHURIS.**

Sublimed Sulphur, 1; Benzoated Lard, 4: mix. =(1 in 5).

(Belg., 1 in 5, also alkaline 1 in 5½; Fr., Pommade, 1 in 10, also precipitated, 1 in 10; Port., 3 in 10, also Compound, 1 in 5; Russ., 1 in 3, also Compound, 1 in 10; Span., 1 in 5; Swiss, 3 in 10, also Compound, 1 in 10; U.S., 3 in 10; Austr., Dutch, Hung., Norw., and Swed. (Compound *see* below), 3 in 20.)

Precipitated Sulphur makes a more active Ointment, and Essence of Lemon covers the odour.

An **ointment** ¼ of B.P. strength exerts a destructive effect on the ringworm fungus.—*B.M.J.* '89, i. 398.

### Not Official.

**UNGUENTUM SULPHURIS COMPOSITUM.** *Syn.*—UNG. AD SCABIEM VIENNENSE. WILKINSON'S OINTMENT.

Sulphur, 15; Chalk, 10; Tar, 15; Lard, 30; Soap, 30.

This is the formula official in Austr., Dutch, Hung., Norw. and Swed.

**CHELSEA PENSIONER.**—Sulphur, 6; Mustard, 6; Powdered Guaiacum, 3; Rhubarb, 1½; Nitre, 1½: mix. Honey or Treacle sufficient to make it into an Electuary.

**Dose.**—A teaspoonful every alternate evening for rheumatism; it is also taken in the morning as an aperient to regulate the bowels.

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### Not Official.

## SULPHURIS CHLORIDUM.

### CHLORIDE OF SULPHUR.

$S_2Cl_2$, eq. 135.

Prepared by the direct union of Chlorine with Sulphur, forming a mobile reddish-yellow liquid, sp. gr. 1·69, with a penetrating disagreeable odour, and fuming strongly in air. It dissolves without decomposition in Bisulphide of Carbon or Benzol, but is decomposed by Water, Alcohol and Ether.

### Preparation.

**UNGUENTUM SULPHURIS HYPOCHLORITIS.**—The ointment prescribed under this name is composed of Sublimed Sulphur, 1 oz.; Chloride of Sulphur, 1 drm.; Spermaceti Ointment, B.P. 1867, 8 oz.: Essential Oil of Almonds, 80 min., is usually added to mask the disagreeable odour.

Used in the treatment of scabies and acne.

## SULPHURIS IODIDUM.

### IODIDE OF SULPHUR.

The proportions of Iodine and Sulphur are used in equivalents to form $\dot{S}\dot{I}$, eq. 159, but the combination is a very loose one.

Iodine, 4; Sublimed Sulphur, 1: rub together in a glass or earthenware mortar until they are thoroughly mixed. Transfer to a flask, close the orifice loosely, and apply heat gently so that the colour of the mass shall become gradually darkened. When the colour has become uniformly dark throughout, increase the heat so as to produce liquefaction. Then incline the flask in different directions, in order to return into the liquid any portion of the Iodine which may have been condensed on the inner surface of the vessel. Lastly, withdraw the heat, and when the liquid has congealed, remove the mass by breaking the flask, reduce it to pieces, and keep these in a well-stoppered bottle. A greyish-black solid, with a radiated crystalline appearance.

**Solubility.**—1 in 60 of Glycerine; 1 in 4 of Bisulphide of Carbon. Insoluble in Water

**Test.**—If 100 grs. be thoroughly boiled with Water, the Iodine will pass off in vapour, and about 20 grs. of Sulphur will remain.

(Belg., Ioduretum Sulphuris; Dutch, Iodetum Sulphuris c Sulphure; Port., Enxofre Iodado; Span., Ioduro de Azufre; U.S., Sulphuris Iodidum; not in the others.)

**Medicinal Properties.**—The Ointment is an excellent remedy for acne punctata and other eruptions of the skin.

### Preparation.

**UNGUENTUM SULPHURIS IODIDI.**

Iodide of Sulphur, 30 grs.; Hard Paraffin, ¼ oz.; Soft Paraffin, ¾ oz.; triturate the Iodide of Sulphur in a glass or porcelain mortar, and gradually add the melted mixture of Hard and Soft Paraffins, rubbing them together until the ointment is perfectly cold and free from grittiness. =(about 1 in 15½).

(Port., 1 in 10; not in the other Pharmacopœias.)

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## SUMBUL RADIX.

### SUMBUL ROOT.

The dried transverse sections of the root of *Ferula Sumbul.*

Imported from Russia and India. It possesses a powerful odour resembling Musk.

(Port., Sombula; U.S.; not in the others.)

**Medicinal Properties.**—A nerve tonic, said to be useful in hysteria and nervous complaints.

### Preparation.

**TINCTURA SUMBUL.**

Sumbul Root, in No. 40 powder, 1; Rectified Spirit, 8: macerate forty-eight hours with 6 of the Spirit, agitating occasionally; pack in a percolator, let it drain, and pour on the remainder of the Spirit, and when it ceases to drop, press, filter, and add Rectified Spirit to make 8.

**Dose.**—10 to 30 minims. =(1 in 8).

(U.S., 1 in 10; not in the other Pharmacopœias.)

## SUPPOSITORIA.

Suppositories are for the most part prepared by the following general formula:—

Mix the Medicinal portion with a small quantity of the Oil of Theobroma, by rubbing them together, and add the mixture to the remainder of the Oil of Theobroma, previously melted at a low temperature. Then mix thoroughly without applying more heat, and immediately pour the mixture into suitable moulds; or the fluid mixture may be allowed to cool, and then be divided into equal parts, each of which shall be made into a conical or other convenient suppository.

The moulds, previously made cold, must be kept so in summer by immersion in iced water. All difficulty in removing the suppositories from the moulds may be obviated by having the moulds previously wiped over with some oiled lint.

Cocoa-nut **Stearine** (p. 507) is in many instances a better basis for Suppositories than Oil of Theobroma.

| | | Each contains |
|---|---|---|
| SUPPOSITORIA ACIDI CARBOLICI c. SAPONE | | 1 gr. |
| SUPPOSITORIA ACIDI TANNICI | | 3 grs. |
| SUPPOSITORIA ACIDI TANNICI c. SAPONE | | 3 grs. |
| SUPPOSITORIA GLYCERINI | | |
| SUPPOSITORIA HYDRARGYRI. | Mercurial Ointment | 5 grs. |
| SUPPOSITORIA IODOFORMI | | 3 grs. |
| SUPPOSITORIA MORPHINÆ. | Hydrochlorate of Morphine. | ½ gr. |
| SUPPOSITORIA MORPHINÆ c. SAPONE. | ditto | ½ gr. |
| SUPPOSITORIA PLUMBI COMPOSITUM. | Acetate of Lead<br>Powdered Opium | 3 grs.<br>1 gr. |

Suppositories, not official, are enumerated in the Index.

Not Official.

## SYMPHYTI RADIX.

COMMON COMFREY ROOT.

The root is black without and white within. Flowers yellow, common in ditches near rivers.

(Belg., Radix Symphiti; Fr., Consoude; Port., Consolda Maior; Span., Sinfito Mayor; not in the others.)

**Medicinal Properties.**—Astringent, mucilaginous, glutinous; useful to form cases for injured limbs. The black rind is scraped off, and the mucilaginous root is then scraped carefully into a nice even pulp; this spread of the thickness of a crown-piece upon cambric or old muslin, is wrapped round the limb and bandaged over; it shortly stiffens, and forms a casing superior to starch, giving support and strength to the part. The Author knew a bone-setter who practised more than fifty years ago, and rendered himself famous for setting compound fractures with this root, which he kept secret, and he never removed the bandage after the first dressing until the limb was well.

# SYRUPI.

## SYRUPS.

Syrups are apt to ferment or mould when made with too little Sugar, and to crystallise when too concentrated, or when they contain Acids or Alcohol; to avoid these inconveniences which have arisen from former instructions for the preparation of this class of medicines, the British Pharmacopœia usually directs that the product of each Syrup shall be made up to one constant weight, thereby ensuring uniformity of consistence, which is perhaps as good a practical guide as taking the specific gravity, when cooled to 60° F. In the case of Simple Syrup the specific gravity given, namely, 1·330, is a very proper one for ordinary temperatures, but it must be understood that if the Syrup be exposed to a very low temperature, say 40° F., it may crystallise. It keeps perfectly well, however, at a range of temperature from 50° F. upwards.

Although 1·330 is accepted as the best gravity for a permanent Syrup, the B.P. without any very obvious reason, makes some exceptions to the rule—*e.g.*, Syr. Ferri Iodidi, 1·385; Syr. Ferri Phosphatis, 1·305; Syr. Rhei, 1·310. In the case of Syr. Aurant. and Syr. Zingib., where the drug is introduced as a Tincture, the gravity is of course lower.

The following are the Syrups of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

| Dose. | | |
|---|---|---|
| | SYRUPUS. *See* SACCHARUM | Sugar 1 in 1⅙. |
| 1 drm. | SYRUPUS AURANTII | Tinct. 1 in 8. |
| 1 drm. | SYRUPUS AURANTII FLORIS | O.F. Water 1 in 6¾. |
| ½ to 2 drs. | SYRUPUS CHLORAL | 1 in 5½. |
| ½ drm. | SYRUPUS FERRI IODIDI, 4⅓ grs. (anhydrous) in each drm. | |
| 1 drm. | SYRUPUS FERRI PHOSPHATIS, 1 gr. (anhydrous) in each drm. | |
| ½ to 1 drm. | SYRUPUS FERRI SUBCHLORIDI. | |
| 1 drm. | SYRUPUS HEMIDESMI | 1 in 8. |
| 1 drm. | SYRUPUS LIMONIS | Juice 1 in 2. |
| 1 drm. | SYRUPUS MORI | Juice 1 in 2. |
| 1 drm. | SYRUPUS PAPAVERIS | Capsules 1 in 2¼. |
| 1 drm. | SYRUPUS RHEI | Root 1 in 15. |
| 1 drm. | SYRUPUS RHŒADOS | Petals 1 in 3½. |
| 1 drm. | SYRUPUS ROSÆ GALLICÆ | Petals 1 in 17¼. |
| ½ drm. | SYRUPUS SCILLÆ | 1 in 16. |
| 1 drm. | SYRUPUS SENNÆ | 1 in 2. |
| 1 drm. | SYRUPUS TOLUTANUS. *See* BALS. TOLU. | 1 in 29. |
| 1 drm. | SYRUPUS ZINGIBERIS | Strong Tinct. 1 in 27. |

Syrups that are not official are enumerated in the Index.

# TABACI FOLIA.

## LEAF TOBACCO.

The dried leaves of the Virginian Tobacco, *Nicotiana Tabacum.*

When dry they yield about 20 p.c. of ash, containing a large proportion of Potash.

The Virginian leaf contains about 6 p.c. of **Nicotine,** and is one of the strongest varieties of Tobacco.

**Test.**—It yields, when distilled with Solution of Potash, an alkaline fluid which has the peculiar odour of Nicotina, and precipitates with Perchloride of Platinum and Tincture of Galls.

(Belg., Ger., Norw., Russ., Swed. and Swiss, Folia Nicotiana; Fr., Nicotiane ou Tabac; Port. and Span., Nicociana; U.S., Tabacum; not in Austr., Dan., Dutch, Hung. or Ital.)

**Medicinal Properties.**—A powerful sedative, especially affecting the heart, frequently causing great depression. Narcotic and emetic. It is dangerous on account of its poisonous properties. Smoked, it is sedative and expectorant in various cases of asthma. Occasionally used as snuff for affections of the head.

**Tobacco Juice** (a strong infusion) is a powerful insecticide, but some preparations for this purpose contain Arsenic in addition to the Tobacco, and in a case that came under our notice, several animals were killed by the Arsenic.

**Antidotes.**—In case Tobacco has been swallowed, an emetic; in any case stimulants internal and external. Recumbent position; Tannic Acid; Nux Vomica or Strychnine.

**Not Official.**

**NICOTINE** ($C_{10}H_{14}N_2$, eq. 162).—A nearly colourless volatile liquid alkaloid, sp. g. 1·011, with an acrid burning taste, inflammable, miscible with Water, Ether, Alcohol, and the fixed Oils. Boiling point about 250° C. To this alkaloid Tobacco owes its activity. The most easily crystallised salt is the Acid Tartrate. Nicotine is a powerful poison.

(Swed.; not in the other Pharmacopœias.)

## TAMARINDUS.

### TAMARIND.

The preserved pulp of the fruit of *Tamarindus Indica.*

Imported from the West Indies.

**Test.**—A piece of bright Iron left in contact with the pulp for an hour does not exhibit any deposit of Copper.

The Tamarind Acid equal to about 10 per cent. (calculated as Tartaric) would take up Copper if such vessels were used.

(In all the Pharmacopœias except Dan.)

**Medicinal Properties.**—Refrigerant and slightly laxative. Infused with water, forms a cooling drink in febrile affections.

**Dose.**—$\frac{1}{4}$ oz. and upwards.

Contained in Confectio Sennæ.

## TARAXACI RADIX.

### DANDELION ROOT

The fresh and dried roots of *Taraxacum officinale,* collected in the autumn from indigenous plants.

Much difference of opinion exists as to the proper time of taking up the root. Some think that the winter, when it yields the thick albuminous juice, is the best; others prefer the thin and bitter juice yielded by the root in the early summer. The Author inclined to the former opinion, and so expressed himself in an article furnished to Mr. Brande,* and inserted by him in his "Materia Medica," published in 1839. Observations made throughout the year are there given. Juice taken from roots dug up in November, before any frost appeared, had a specific gravity of 1·080; 28 pounds of root yielded 7 pounds of Juice, from which, when heated to 212° F., besides 4 ounces of insoluble matter, it left on evaporation 28 ounces of Extract. This is not a correct average, for when in the highest perfection—

100 of fresh root yield 30 of juice = 8 of extract. 100 of root, when dried, weigh 25.

(In all the Pharmacopœias; Fr., Pissenlit; Ital., Tarassaco.)

**Medicinal Properties.**—A mild laxative and cholagogue. In dropsy, arising from obstruction of the liver, it is given in combination with purgatives.

*A very feeble stimulant of the liver.—Dr. Rutherford.*

## Preparations.

### DECOCTUM TARAXACI.

Dried Dandelion Root, sliced and bruised, 1; Distilled Water, 20: boil ten minutes then strain, and pour as much Distilled Water over the contents of the strainer as will make the strained product measure 20. =(1 in 20).

**Dose.**—2 to 4 oz.

(Span., 1 of leaves in 46; not in the other Pharmacopœias.)

### EXTRACTUM TARAXACI.

Crush fresh Dandelion Root, press out the juice, and allow it to deposit; heat the clear liquor to 212° F. (100° C.), and maintain the temperature for ten minutes; then strain and evaporate by a water-bath at a temperature not exceeding 160° F. (71·1° C.) to a proper consistence for forming pills.

**Dose.**—5 to 30 grs.

(Ital. and U.S., from **fresh root**; Swiss, from **dried root**; Fr., from **dried leaves**; Austr., Belg., Dan., Dutch, Ger., Hung., Norw., Port., Russ. and Swed., from **whole plant**; Span., clarified juice of **fresh leaves** evaporated, also aqueous from **dried leaves.**)

### EXTRACTUM TARAXACI LIQUIDUM.

Dry Dandelion Root, in No. 20 powder, 40; Proof Spirit, 80; Distilled Water, a sufficiency. Macerate the Dandelion in the Spirit forty-eight hours; then press out 20 of liquid and set this aside. Macerate the marc with 40 to 60 of the Water forty-eight hours; press out and strain the liquid, and evaporate on a water-bath to about 18. Mix the spirituous and aqueous extractions together and make up with Distilled Water to 40. Finally filter.

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* Brande's "Materia Medica," published in 1839, is now very scarce; the following interesting facts have been copied from it to show the quantity of juice required to produce 1 lb. of extract in the different months.

"In January and February, 4 to 5 lbs.; in March, 6 or 7 lbs.; in April and May, 8 to 9 lbs. June, July, and August, 6 to 7 lbs.; in September and October, 4 to 5 lbs.; in November and December, 4 lbs. During November and December the root is in the most vigorous condition, and most abundant in those ingredients upon which its medicinal powers depend. Frost has a singular effect upon the growing roots, causing the bitterness to decrease, and sweetness to take its place; it is also observable that, on the disappearance of the frost, the sweetness disappears and the bitter returns in a stronger degree. From Mr. Squire's analysis, Taraxacum juice contains gum, albumen, gluten, an odorous principle, and a crystallisable bitter principle, soluble in alcohol and water."

When made in this way it deposits greatly. A much better Fluid Extract is made by percolation with a mixture of Proof Spirit and Water in equal proportions.

**Dose.**—15 to 120 minims.

(Russ. and U.S.; not in the others.)

### SUCCUS TARAXACI.

Bruise Fresh Dandelion Root in a stone mortar, press out the Juice, and to every 3 measures of Juice add 1 of Rectified Spirit; set aside seven days and filter. Keep it in a cool place.

**Dose.**—60 to 120 minims.

(Not in the other Pharmacopœias.)

### Not Official.

**LIQUOR TARAXACI.**—A preparation resembling the Succus, but in which the Spirit is added directly to the bruised root before pressing. Introduced many years before the Succus and superior to it. The opinion (*C.D.* '92, i. 612) is wrong that Liquor in this case is synonymous with Fluid Extract, in which preparation the root depreciates considerably in the drying.

### Not Official.

## TEREBENUM.

### TEREBENE.

The liquid obtained from Oil of Turpentine after successive treatments with a small proportion of Sulphuric Acid till the optical rotation is reduced to zero, followed by distillation in a current of steam.

Sp. g. about ·864. Distils between 312° and 330° F.

**Solubility.**—1 in 6½ of Rectified Spirit; in all proportions of Absolute Alcohol or Chloroform; 1 in 3¾ of Ether; 5 in 8 of Glacial Acetic Acid; very sparingly in Water.

**Test.**—It is optically inactive to polarized light.

(Russ. and U.S.; not in the others.)

**Medicinal Properties.**—Used for the relief of winter cough (chronic bronchitis). Five or six drops given on Sugar every four hours, or suspended with Mucilage, or used as a spray, or as an antiseptic inhalation from a respirator.—*B.M.J.* '86, i. 259, 392; '87, i. 796; *P.J.* xvi. 611.

Can be dispensed in **Flexible Capsules** containing 5 and 10 minims each.

**Terpene Hydrate.**—A colourless crystalline solid, slightly soluble in Water, freely in Alcohol. Dose, 3 to 10 grains. Used in bronchitis and other respiratory disorders.

(Ger., Russ., Swiss and U.S.; not in the others.)

**Terpinol.**—An oily liquid. Dose, 2 grains.

# TEREBINTHINA CANADENSIS.

CANADA TURPENTINE.

*B.P.Syn.*—CANADA BALSAM.

The Turpentine obtained by puncturing or incising the bark of the trunk and branches of *Pinus balsamea.* A pale yellow and faintly greenish transparent oleo-resin, of the consistence of thin honey; solidifying when mixed with about a sixth of its weight of Magnesia.

**Solubility.**—Soluble in all proportions of Benzol, Chloroform, and Ether; 1 in 3 (*or less*) of Absolute Alcohol; 1 in 1 (*or less*) of Rectified Spirit.

**B.P.Dose.**—20 to 30 grains.

(U.S.; not in the other Pharmacopœias.)

Used in the preparation of Charta Epispastica and Collodium Flexile.

By long exposure to air at the ordinary temperature, or quickly when heated, it loses about 25 p. c. of its weight of volatile Turpentine, and forms a hard brittle solid, which, dissolved in Benzol, Toluol, or Xylol is much used as a medium for mounting microscopical objects, and as a cement for glass; it is also used in its natural state for the same purposes.

Not Official.

## TEREBINTHINA CHIA.

CHIAN TURPENTINE.

An oleo-resin obtained from the incised trunk of *Pistacia terebinthus,* collected in Scio.

A soft solid with a characteristic odour. When treated with its own weight of Absolute Alcohol or Pure Ether, the bulk dissolves, leaving a residue.

(Fr., Térébinthine de Chio: Port., Terebinthina de Chio; Span., Trementina de Chio; not in the others.)

It was official in the London and Edinburgh Pharmacopœias.

**Medicinal Properties.**—Has been recommended in the treatment of cancer.

REFERENCES.—*L.* '80, i. 477; '87, ii. 1005, 1144, 1190, 1244.

**Dose.**—5 to 10 grains.

### Preparation.

**PILULA TEREBINTHINÆ CHIÆ.**—Chian Turpentine, 6 grs.; Sublimed Sulphur, 4 grs. To be made into 2 pills, and taken every four hours.

A case is reported of these pills forming a compact mass in the bowel, removed by enemas.—*C.D.* '90, ii. 75.

# TEREBINTHINÆ OLEUM.

OIL OF TURPENTINE.

The oil distilled usually by aid of steam from the oleo-resin (Turpentine) obtained from *Pinus Australis, Pinus Tæda,* sometimes from *Pinus Pinaster* and *Pinus Sylvestris*; rectified if necessary. Limpid, colourless, with a strong peculiar odour, which varies in the different kinds, and a pungent bitterish taste. It commences to boil at about 320° F. (160° C.), and almost entirely distils below 356° F. (180° C.), little or no residue remaining.

English Oil of Turpentine is almost wholly imported from America, and is the product (mainly) of *Pinus Australis* and *P. Tæda.* German and Russian Oil is principally distilled from *P. Sylvestris*; French Oil from *P. Maritima*. Hungarian Turpentine is distilled from the cones of *P. Pumilio*, and Carpathian Turpentine from *P. Cembra* or *P. Pumilio*.

The Specific Gravities vary between ·860 and ·880; the boiling point approximates to 160° C. The French Oil is strongly lævo-rotatory, but both English and Russian Oils are dextro-rotatory.

Oil of Turpentine, especially Russian, when exposed to the continuous action of atmospheric air in presence of water, develops a large quantity of Hydrogen Peroxide, Camphoric Acid, and other oxygenated products, which form the basis of the "Sanitas" series of disinfectants.

Oil of Turpentine dissolves Wax, Iodine, Sulphur, Phosphorus, fixed Oils, and Resins forming varnish.

**Solubility.**—1 in 6½ of Rectified Spirit; in all proportions of Absolute Alcohol, Bisulphide of Carbon, and Chloroform; 3 in 10 of Ether; 1 in 3 of Glacial Acetic Acid.

(Austr., Dutch, Ger., Hung., Russ., Swiss and U.S., Oleum Terebinthinæ; Belg., Essentia Terebinthinæ; Dan., Norw. and Swed., Ætheroleum Terebinthinæ; Fr., Essence de Térébenthine; Ital., Essenza di Trementina; Port., Essencia de Terebinthina; Span., Esencia de Trementina.)

**Medicinal Properties.**—Antiseptic, stimulant, diuretic, anthelmintic. Useful in passive hæmorrhage from the various organs; in large doses purgative, sometimes causing nausea, vomiting, and intoxication. It especially affects the kidneys, and the mucous membrane of the genito-urinary organs. Antispasmodic in hysterical affections. Used as an **inhalation** in chronic bronchitis; as an **enema** for obstinate constipation, and for flatulency of the bowels. Externally rubefacient and counter-irritant; employed as a **liniment** in chronic inflammation and rheumatism.

Flies and gnats are kept away by the odour of Turpentine.

**Dose.**—10 to 30 minims; as an anthelmintic, 2 to 4 drms. May be given in Mistura Amygdalæ.

1 drm. of Mucilage, with diligent trituration, renders ½ drm. of Oil of Turpentine emulsive, with 1 oz. of Distilled Water.

30 grs. Powder of Acacia rubbed first with 1 drm. of Oil of Turpentine, then with 1 drm. of Water, and lastly triturating whilst adding gradually 1 oz. Distilled Water, makes a good emulsion.

**Antidotes.**—Emetic, Epsom Salts, demulcent drinks, Morphine or Laudanum to relieve pain.

## Preparations.

### CONFECTIO TEREBINTHINÆ.

Oil of Turpentine, 1; Liquorice Powder, 1; Clarified Honey, 2: mix. =(1 in 4).

Rub the first two together, and add the Honey; but if the Turpentine separates pour it off, and re-add it gradually with constant trituration, and it will unite.

**Dose.**—60 to 120 grs.

Large doses are sometimes given for Tænia, 2 to 4 oz.; but combined with a purgative to prevent absorption.

(Not in the other Pharmacopœias.)

It is much used in Dublin as a diffusible stimulant in chronic bronchitis, and is very palatable if rubbed up with Peppermint Water.

### ENEMA TEREBINTHINÆ.

Oil of Turpentine, 1 oz.; Mucilage of Starch, 15 oz.: mix for 1 enema.

(Not in the other Pharmacopœias.)

### LINIMENTUM TEREBINTHINÆ.

Oil of Turpentine, 16; Camphor, 1; Soft Soap, 2; Distilled Water, 2: mix the Soap with the Water; dissolve the Camphor in the Turpentine; rub these together till thoroughly mixed. =(1 in $1\frac{1}{4}$).

This frequently makes a jelly, which, on the addition of Water, forms a fluid emulsion. The quantity of Water required varies from two to three times that given in the formula.

The late Professor Redwood (who was responsible for this formula) has given his opinion (*P.J.* xvii. 741) that it should form a "thick creamy emulsion," so thick that it can only be dispensed in a wide-mouthed bottle, which afterwards becomes more fluid.

Our own opinion is that the thin emulsion obtained by increasing the Water as above is preferable.

A very good alternative formula is given *Y.B.P.* '88, 208.

(U.S., Resin Cerate 65, Ol. Turpentine 35; not in the others.)

### LINIMENTUM TEREBINTHINÆ ACETICUM.

Oil of Turpentine, 4; Glacial Acetic Acid, 1 (by weight); Liniment of Camphor, 4: mix. =(about 1 in 2).

An imitation of St. John Long's celebrated Liniment.

(Swed. (Linimentum Terebinthinæ Acetatum), 9 Oil in 20; Swiss (Linimentum Terebinthinæ Compositum), about 3 Oil in 10; not in the others.)

### UNGUENTUM TEREBINTHINÆ.

Oil of Turpentine, 2; Resin, in powder, $\frac{1}{4}$; Yellow Wax, 1; Prepared Lard, 1: melt the ingredients together over a water-bath, remove the vessel and stir till cold. =(1 in $2\frac{1}{8}$).

(Dan., Dutch, Fr., Ger., Ital., Norw., Port., Russ. and Swed., differ from this in composition; not in the others.)

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Not Official.

## THALLINÆ SULPHAS.

$(C_{10}H_{13}NO)_2.\ H_2SO_4.$

The Sulphate of a synthetically-prepared base derived from Chinoline, the full name of which is Tetrahydroparaquinanisol or Tetrahydroparamethyloxychinolin.

A yellowish-white crystalline powder, with an odour resembling that of Coumarin, and an aromatic bitter taste. Its dilute aqueous solution gives a green colour with Ferric Chloride.

The free base is precipitated from solutions by Caustic Alkali, and from it are obtained the **Iodide** and other Iodinated compounds (*e.g.*, **Periodotetrahydroparamethyloxychinolinum**) which have been used in the treatment of cancer.

**Solubility.**—1 in 7 of Water.

(Ger. and Russ., Thallinum Sulfuricum; not in the others.)

**Medicinal Properties.**—Antipyretic and antiseptic. Has been recommended internally in typhoid and other fevers.—*L.* '84, ii. 1018; *L.M.R.* '85, 456; *B.M.J.* '87, ii. 1438.

**Dose.**—3 to 8 grains.

For gonorrhœa, an **injection** $2\frac{1}{2}$ grains in 150 minims of Water; a **bougie** 2 grs. in 40 grs. of Cacao Butter.—*B.M.J.* '87, ii. 1438; *L.M.R.* '87, 162.

Adverse results in gonorrhœa.—*B.M.J.* '89, i. 1458.

## THEOBROMATIS OLEUM.

OIL OF THEOBROMA.

*B.P.Syn.*—Cacao Butter.

A concrete oil, obtained by expression and heat from the ground seeds of *Theobroma Cacao*.

Of the consistency of tallow; colour, yellowish; odour, resembling that of chocolate; taste, bland and agreeable; fracture, clean; presenting no appearance of foreign matter. Does not become rancid from exposure to air. Usually melts between 86° and 95° F. (30° and 35° C.).—*Brit. Ph.*

Contained in several of the Official suppositories.

Some interesting notes on the **melting point** of Cacao Butter will be found *P.J.* xxiii. 247. The principal points are: (1) m. p. of trade samples by Redwood's Mercury process 73°—91° F.; (2) m. p. raised and finally lowered by continued heat above its melting point; (3) m. p. in capillary tubes depends upon diameter of bore, the smaller the bore the lower the m. p.; (4) after melting, Cacao Butter takes about twenty-four hours in capillary tubes, to regain its original m. p.

It has been shown (*C.D.* '89, i. 800) that a large number of chemicals used in the form of suppositories caused the melting point of the mixture to be several degrees higher than the base employed.

Cocoanut Stearine is a better substance than Cacao Butter for making suppositories. *See* p. 507.

(Austr., Belg., Dan., Dutch, Ger., Hung., Norw., Russ., Swed. and Swiss, Oleum Cacao; Fr., Beurre de Cacao; Ital., Burro di Cacao; Port., Oleo de Cacao; Span., Aceite de Cacao; U.S., Oleum Theobromæ.)

### Not Official.

**THEOBROMINE** ($C_7H_8N_4O_2$).—The alkaloid contained in the Cacao seeds, which, deprived of part of their fixed oil, constitute the bulk of the commercial "Cocoa" so largely used as a beverage. It is closely allied to Caffeine, and has a similar physiological action but stronger. It is much less soluble in water than Caffeine, and acts the part of a weak acid, forming compounds with alkalies. The seeds contain 1 to 2 p. c. of the alkaloid.

**DIURETIN.**—A compound of Sodium-Theobromine with Sodium-Salicylate. Its action seems to be purely diuretic. Dose.—10 to 20 grains thrice daily.

## THERIACA.

TREACLE.

*N.O.Syn.*—Sacchari Fæx (*Lond.*).

The uncrystallised residue of the refining of Sugar.

A thick fermentable Syrup of a golden colour, very sweet; not crystallising by rest or spontaneous evaporation.

Sp. g. about 1·40.

**Test.**—Free from empyreumatic odour or flavour.

(Not in the other Pharmacopœias.)

**Medicinal Properties.**—Demulcent, nutrient, and slightly laxative. A favourite condiment in pharmacy, chiefly employed to make pills, for which, on account of its retentiveness of moisture, it is well adapted.

Contained in several of the Pilula and in Tinctura Chloroformi et Morphinæ

## THUS AMERICANUM.

### COMMON FRANKINCENSE.

The concrete Turpentine which is scraped off the trunks of *Pinus Australis* (*P. palustris*), and *Pinus Tæda.*

From the Southern States of North America.

When fresh, it is a softish bright yellow opaque solid, resinous but tough, having the odour of crude American turpentine, but by keeping it becomes dry and brittle, darker in colour and of a milder odour.

**Solubility.**—Almost wholly soluble 1 in 1 of Rectified Spirit; entirely 4 in 3 of Ether.

The true Thus is *Pix Burgundica,* from the Spruce Fir, *Abies excelsa. See* PIX BURGUNDICA, page 409.

**Medicinal Properties.**—Used externally as a stimulant.

Used in the preparation of Emplastrum Picis.

## THYMOL.

### THYMOL.

$C_{10}H_{13}HO$.

A stearöptene obtained from the volatile oils of *Thymus vulgaris, Monarda punctata,* and *Carum Ajowan,* by saponifying with Caustic Soda and treating the separated Soap with Hydrochloric Acid. It may also be obtained from a distilled* fraction of the oil by exposure at a low temperature. It is purified by recrystallisation from Alcohol.

Large, oblique, prismatic crystals, having the odour of Thyme and a pungent aromatic flavour. The crystals sink in cold Water, but on heating the mixture to 110° to 125° F. (43·3° to 51·7° C.) they melt and rise to the surface. The crystals volatilise completely at the temperature of a water-bath. A solution of Thymol in half its bulk of Glacial Acetic Acid, warmed with an equal volume of Sulphuric Acid, assumes a reddish-violet colour.

**Solubility.**—1 in 1500 of Water; 1 in 190 of Glycerine; 8 in 3 of Rectified Spirit or Ether; 8 in 5 of Chloroform; 1 in 6 of Benzin; 1 in 3 of Oil of Turpentine; 1 in 2 of Olive Oil; 4 in 3 of Glacial Acetic Acid; 1 in 6 of Solution of Potash.

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* It is from the less volatile, or undistilled fraction of the oil from which Thymol is obtained. Commercial Oil of Thyme is generally the more volatile hydrocarbons left after extraction of the Thymol.

(Austr., Dan., Ger., Hung., Russ. and Swiss, Thymolum; Dutch, Fr. and U.S., Thymol; Ital., Timolo; Span., Timol; not in the others.)

**Medicinal Properties.**—A saturated **solution** in Water is a very powerful antiseptic; it arrests fermentation in a solution of Sugar and Yeast better than either Carbolic Acid or Salicylic Acid, and it also arrests putrefaction of animal matters.—*B.M.J.* '75, i. 680.

It is a very powerful deodorant.

**B.P. Dose.**—½ to 2 grs.

Usually employed as a deodorant, which property it possesses to a marked degree; its **aqueous solution** is very useful in a night commode, and an extremely small quantity of it will keep urine, when it is required to make a twenty-four hours' collection.

### Not Official.

**LIQUOR THYMOLIS.**—Thymol, 1; Rectified Spirit, 100. This solution is very useful, as it may be diluted to any extent with Water without precipitation. Half a pint diluted to a gallon is about the same strength as a saturated aqueous solution.

**THYMOL ANTISEPTIC DRESSINGS.**—**Gauze**, 5 p. c., and **Wool**, 5 p. c.

**VAPOR THYMOLIS** (*T.H.*).—Thymol, 6 grs.; Rectified Spirit, 60 mins.; Light Carbonate of Magnesia, 3 grs. Water to 1 oz.; mix.

A teaspoonful in a pint of Water at 140° F. for each **inhalation.**

A strong stimulant and disinfectant.

### Not Official.

## THYROID GLAND.

Since 1891 various preparations of the thyroid gland have been used with success in the treatment of myxœdema; under such treatment the characteristic symptoms of the disease have disappeared. Relief can thus be obtained, although the disappearance of the symptoms may not be permanent after suspension of the treatment.

References.—*B.M.J.* '91, ii. 796, 798; '92, ii. 449, 613, 894, 940, 1386; '93, i. 737; '93, ii. 217; *L.* '92, ii. 941; '93, i. 580; preparations, *B.M.J.* '92, ii. 1384, 1459; *L.* '93, i. 273, 396; *C.D.* '93, i. 296; *P.J.* xxiii. 321, 360, 379; *C.D.* '93, i. 296.

## TINCTURÆ.

### TINCTURES.

Most of the Tinctures of the British Pharmacopœia are directed to be made by maceration, and subsequent washing in a percolator; the greater part of these are made on this general formula:—Macerate 2½ of the drug in powder (coarse or fine as specified), in 15 of the Spirit (strength indicated), for 48 hours in a closed vessel, agitating occasionally; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with the remaining 5 of the Spirit. Afterwards subject the contents of the percolator to pressure, filter the product, mix the liquids, and add sufficient of the Spirit to make 20.

Others are made on the same general formula, with an alteration of the quantity of active ingredient; a large number of the Tinctures are made by simple maceration.

Tincture of Opium is standardised, and Tincture of Nux Vomica is prepared from a standard Extract.

When practicable, a better method than the above process of maceration and washing, is to thoroughly damp the materials with some of the Spirit (about one-sixth of the Official quantity given above), and after 24 hours, pack them in the percolator (a shape more cylindrical than conical is best), and pass the remainder of the Spirit slowly through the materials, regulating the outflow so that the top shall not become dry as long as any Spirit remains to go on. Finally drain, press, and make up to the required quantity.

In the case of Tr. Card. Co. the materials should be rubbed together in a mortar and packed without Spirit; while with Myrrh, percolation is impossible without previous maceration.

Regarding the Foreign Pharmacopœias, it may be noted that Austr., Dan., Dutch, Ger., Russ., Swiss and U.S., standardise Tincture of Opium; Dutch and U.S. prepare their Tincture of Nux Vomica from a standard Extract. Although in Swiss the Tinctures are made to a given weight, yet there is a rough attempt at standardisation of the Tinctures of Aconite, Belladonna, Colchicum, Ergot, Gelsemium, Ipecacuanha, Nux Vomica, and Sabadilla, by directing that a certain quantity of the Tincture shall yield a flocculent precipitate with Mayer's reagent; Tincture of Digitalis should be rendered opaque by Tannic Acid; the details of the operation are given under the several Tinctures. Tincture of Opium is standardised in the usual manner.

The following are the Tinctures of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared; all are made with Proof Spirit unless otherwise stated.

| Dose. | | Proportion of ingredient. | |
|---|---|---|---|
| 5 to 15 min. | TINCTURA ACONITI | 1 in 8. | Rect. Sp. |
| 1 to 2 drm. | TINCTURA ALOES | 1 in 40. | |
| ½ to 1 drm. | TINCTURA ARNICÆ | 1 in 20. | Rect. Sp. |
| ½ to 1 drm. | TINCTURA ASAFŒTIDÆ | 1 in 8. | Rect. Sp. |
| 1 to 2 drm. | TINCTURA AURANTII | 1 in 10. | |
| 1 to 2 drm. | TINCTURA AURANTII RECENTIS | 3 in 10. | Rect. Sp. |
| 5 to 20 min. | TINCTURA BELLADONNÆ | 1 in 20. | |
| ½ to 1 drm. | TINCTURA BENZOINI COMP. | 1 in 10. | Rect. Sp. |
| 1 to 2 drm. | TINCTURA BUCHU | 1 in 8. | |
| ½ to 2 drm. | TINCTURA CALUMBÆ | 1 in 8. | |
| 15 to 60 min. | TINCTURA CAMPHORÆ COMPOSITA.<br>Opium 1, Benzoic Acid 1, Camphor ¾, in 240. | | |
| 5 to 20 min. | TINCTURA CANNABIS INDICÆ (Extract) | 1 in 20. | Rect. Sp. |
| 5 to 20 min. | TINCTURA CANTHARIDIS | 1 in 80. | |
| 10 to 20 min. | TINCTURA CAPSICI | 1 in 27. | Rect. Sp. |
| ½ to 2 drm. | TINCTURA CARDAMOMI COMP. | 1 in 80. | |
| ½ to 2 drm. | TINCTURA CASCARILLÆ | 1 in 8. | |
| ½ to 2 drm. | TINCTURA CATECHU | 1 in 8. | |
| ½ to 2 drm. | TINCTURA CHIRATÆ | 1 in 8. | |
| 20 to 60 min. | TINCTURA CHLOROFORMI COMP. | 1 in 10. | Rect. Sp. |
| 5 to 10 min. | TINCTURA CHLOROFORMI ET MORPHINÆ. | | |
| 15 to 60 min. | TINCTURA CIMICIFUGÆ | 1 in 8. | |
| ½ to 2 drm. | TINCTURA CINCHONÆ | 1 in 5. | |
| ½ to 2 drm. | TINCTURA CINCHONÆ COMP. | 1 in 10. | |
| ½ to 2 drm. | TINCTURA CINNAMOMI | 1 in 8. | Rect. Sp. |
| 30 min. | TINCTURA COCCI | 1 in 8. | |
| 10 to 30 min. | TINCTURA COLCHICI SEMINUM | 1 in 8. | |
| 20 to 60 min. | TINCTURA CONII (Fruit) | 1 in 8. | |
| ½ drm. | TINCTURA CROCI | 1 in 20. | |
| ½ to 2 drm. | TINCTURA CUBEBÆ | 1 in 8. | Rect. Sp. |
| 10 to 30 min. | TINCTURA DIGITALIS | 1 in 8. | |

| Dose. | | Proportion of ingredient. | |
|---|---|---|---|
| 5 to 30 min. | TINCTURA ERGOTÆ | 1 in 4. | |
| 5 to 30 min. | TINCTURA FERRI ACETATIS (Liquor) | 1 in 4. | Rect. Sp. and Water. |
| 10 to 30 min. | TINCT. FERRI PERCHLORIDI (Liquor) | 1 in 4. | |
| ½ to 2 drm. | TINCTURA GALLÆ | 1 in 8. | |
| 5 to 20 min. | TINCTURA GELSEMII | 1 in 8. | |
| ½ to 2 drm. | TINCTURA GENTIANÆ COMP. | 1 in 13⅓. | |
| ½ to 1 drm. | TINCTURA GUAIACI AMMONIATA | 1 in 5. | Arom. Sp. Ammon. |
| 5 to 60 min. | TINCTURA HAMAMELIDIS | 1 in 10. | |
| 20 to 60 min. | TINCTURA HYDRASTIS | 1 in 10. | |
| ½ to 1 drm. | TINCTURA HYOSCYAMI | 1 in 8. | |
| 5 to 20 min. | TINCTURA IODI. Iodine 1, Iodide Potass. | 1 in 40. | Rect. Sp. |
| ½ to 1 drm. | TINCTURA JABORANDI | 1 in 4. | |
| ½ to 2 drm. | TINCTURA JALAPÆ | 1 in 8. | |
| ½ to 2 drm. | TINCTURA KINO | 1 in 10. | Sp. and Glycerine. |
| ½ to 2 drm. | TINCTURA KRAMERIÆ | 1 in 8. | |
| 20 to 30 min. | TINCTURA LARICIS | 1 in 8. | Rect. Sp. |
| ½ to 2 drm. | TINCTURA LAVANDULÆ COMP. (Oil). | 1 in 213. | Rect. Sp. |
| ½ to 2 drm. | TINCTURA LIMONIS | 1 in 8. | |
| 10 to 30 min. | TINCTURA LOBELIÆ | 1 in 8. | |
| 10 to 30 min. | TINCTURA LOBELIÆ ÆTHEREA | 1 in 8. | Sp. Ether. |
| ½ to 2 drm. | TINCTURA LUPULI | 1 in 8. | |
| ½ to 1 drm. | TINCTURA MYRRHÆ | 1 in 8. | Rect. Sp. |
| 10 to 20 min. | TINCTURA NUCIS VOMICÆ | 1 gr. of Alkaloids in 1 oz. | Rect. Sp. & Water. |
| 5 to 40 min. | TINCTURA OPII | 1 in 13⅓. | |
| ½ to 1 drm. | TINCTURA OPII AMMONIATA | 1 gr. in 96 mins. | Rect. Sp. |
| 15 to 60 min. | TINCTURA PODOPHYLLI | 1 in 55. | Rect. Sp. |
| | TINCTURA PYRETHRI | 1 in 5. | Rect. Sp. |
| ½ to 2 drm. | TINCTURA QUASSIÆ | 1 in 27. | |
| ½ to 2 drm. | TINCTURA QUININÆ | 1 gr. in 60 min. | Tr. Orange. |
| ½ to 2 drm. | TINCTURA QUININÆ AMMONIATA | 1 gr. in 60 mins. | |
| 1 dr. to 1 oz. | TINCTURA RHEI | 1 in 10. | |
| 20 to 60 min. | TINCTURA SABINÆ | 1 in 8. | |
| 10 to 30 min. | TINCTURA SCILLÆ | 1 in 8. | |
| ½ to 2 drm. | TINCTURA SENEGÆ | 1 in 8. | |
| 1 to 4 drm. | TINCTURA SENNÆ. | 1 in 8. | |
| ½ to 2 drm. | TINCTURA SERPENTARIÆ | 1 in 8. | |
| 10 to 30 min. | TINCTURA STRAMONII | 1 in 8. | |
| 2 to 10 min. | TINCTURA STROPHANTHI | 1 in 20. | Rect. Sp. |
| 10 to 30 min. | TINCTURA SUMBUL | 1 in 8. | Rect. Sp. |
| 20 to 40 min. | TINCTURA TOLUTANA—*See* BALSAM | 1 in 8. | Rect. Sp. |
| 1 to 2 drm. | TINCTURA VALERIANÆ | 1 in 8 | |
| ½ to 1 drm. | TINCTURA VALERIANÆ AMMONIATA | 1 in 8. | Arom. Sp. Ammon. |
| 5 to 20 min. | TINCTURA VERATRI VIRIDIS | 1 in 5. | Rect. Sp. |
| 15 to 60 min. | TINCTURA ZINGIBERIS | 1 in 8. | Rect. Sp. |
| 5 to 20 min. | TINCTURA ZINGIBERIS FORTIOR | 1 in 2. | Rect. Sp. |

Tinctures that are not official are enumerated in the Index.

# TRAGACANTHA.

## TRAGACANTH.

A gummy exudation obtained from incisions made in the stem of *Astragalus gummifer*, and some other species of Astragalus.

In white or yellowish flaky pieces, somewhat translucent.

**Tests.**—It is very sparingly soluble in cold Water, but swells into a gelatinous mass, which is tinged violet or blue by Tincture of Iodine.

Pure Tragacanth gives a blue colouration with Iodine, varying in depth in different samples, but in any case it is much too faint to be confounded with added Starch.

After maceration in cold Water, the fluid portion is not precipitated by the addition of Rectified Spirit.

This result depends upon circumstances; if 1½ grains of Tragacanth in powder be treated with an ounce of Water, it forms a thick fluid, which filters but slowly, and the filtrate will yield no precipitate when mixed with an equal volume of Rectified Spirit, but if two volumes of the Spirit be added to one volume of filtrate, precipitation will occur.

(Belg., Dan., Dutch, Fr., Ger., Hung., Norw., Russ., Swed., Swiss and U.S.; Ital., Gomma Adragante; Port., Gomma Adragantha; Span., Tragacanto; not in Austr.)

**Medicinal Properties.**—Demulcent. Used for the suspension of heavy insoluble powders in liquids; 15 grs. of the Compound Powder of Tragacanth being used for each ounce of water.

**Dose.**—Of the powder, 20 grs. or more.

Used in the preparation of Confectio Opii, Confectio Sulphuris, Pilula Ferri, and Pulvis Opii Compositus.

### Preparations.

### GLYCERINUM TRAGACANTHÆ.

Tragacanth, in powder, 110 grs.; Glycerine, 1 oz.; Distilled Water, 74 grs: mix the Tragacanth and Glycerine, add the Water, and rub until a translucent homogeneous jelly is formed.

Used as a **pill excipient**, but we find the following better for that purpose:—

Tragacanth in powder, 1; Glycerine, 6; rub together and keep for two or three days before use to allow it to stiffen.

(Not in the other Pharmacopœias.)

### MUCILAGO TRAGACANTHÆ.

Tragacanth, in powder, 60 grs.; Distilled Water, 10 oz.; Rectified Spirit, 2 fl. drs.: mix the Tragacanth with the Spirit, then pour in the Water with constant agitation. =(1 in 70).

(Belg. 1 in 83; Dutch, 1 in 50; Fr., Mucilage de Gomme Adragante, 1 in 10; Ital. and Port., 1 in 10 and 1 in 100; Russ., Tragacanth 4, Acacia 1, Water 500; U.S., 6 in 100 with Glycerine; not in the others.)

One part of Tragacanth gives more viscosity to water than 25 parts of Gum Acacia.

## PULVIS TRAGACANTHÆ COMPOSITUS.

Tragacanth in powder, 1; Gum Acacia in powder, 1; Starch in powder, 1; Refined Sugar in powder, 3: rub well together.

**Dose.**—20 to 60 grs. =(1 in 6).

(Swiss (Pulvis Gummosus), Tragacanth 2, Gum Arabic 2, Sugar 6; not in the other Pharmacopœias.)

Not Official.

## TRIFOLIUM.

CLOVER.

A **fluid extract** is made from the dried plant, and from this a **syrup,** a teaspoonful of which 3 or 4 times a day is serviceable in Whooping Cough.

Not Official.

## TRITICUM.

CREEPING COUCH GRASS.

The rhizome of *Triticum repens*, gathered in the spring, and deprived of the rootlets.

(Austr., Belg., Dutch and Swiss, Rhizoma Graminis; Fr. Chien-dent; Port., Grama Franceza: U.S., Triticum; not in the others.)

### Preparations.

**DECOCTUM TRITICI.**—Triticum cut small, 1 oz.; Water, 20 oz.: boil ten minutes, and strain when cold.

**Dose.**—4 to 8 oz. three times a day for mucous discharge from the bladder.

(Fr. Tisane 1 in 50.)

**EXTRACTUM TRITICI LIQUIDUM** (*B.P.C.*).—Triticum in No. 20 powder, 10, percolate with Water until exhausted; evaporate the percolate to 15, and add 5 of Rectified Spirit; set aside for 48 hours, filter, and make up to 20 with a mixture of Water 3 and Rectified Spirit 1.

**Dose.**—1 to 6 drms.

More easily prepared, and without heat (which is very detrimental to the Extract) by percolation with the above diluted Alcohol, so as to obtain 20 of finished product from 10 of drug.

(U.S., 1 in 1; not in the other Pharmacopœias.)

## TROCHISCI.

LOZENGES.

The following are the Lozenges of the British Pharmacopœia:—

| | | Quantity of the active ingredient contained in each lozenge. |
|---|---|---|
| TROCHISCI ACIDI BENZOICI | | ½ grain. |
| TROCHISCI ACIDI TANNICI | | ½ grain. |
| TROCHISCI BISMUTHI | (Subnitrate) | 2 grains. |
| TROCHISCI CATECHU | | 1 grain. |
| TROCHISCI FERRI REDACTI | | 1 grain. |
| TROCHISCI IPECACUANHÆ | | ¼ grain. |

| | | Quantity of the active ingredient contained in each lozenge. |
|---|---|---|
| TROCHISCI MORPHINÆ. | (Hydrochlorate) | $\frac{1}{36}$ grain. |
| TROCHISCI MORPHINÆ ET IPECAC. | ,, | $\frac{1}{36}$ and $\frac{1}{12}$ gr. Ipecac. |
| TROCHISCI OPII . . . . . . . | (Extract) | $\frac{1}{10}$ grain. |
| TROCHISCI POTASSII CHLORATIS . . . | | 5 grains. |
| TROCHISCI SANTONINI . . . . . . . . | | 1 grain. |
| TROCHISCI SODII BICARBONATIS . . . | | 5 grains. |
| TROCHISCI SULPHURIS . . . . . . . . | | 5 grains. |

Lozenges that are not official are enumerated in the Index.

Black Currant paste is a most convenient substance for making Lozenges of any special drug.

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Not Official.

## ULEXINE.

An alkaloid prepared from *Ulex Europæus,* the common gorse or furze.

**Solubility.**—Freely soluble in Water and Chloroform; insoluble in Pure Ether.

The **Nitrate, Hydrochlorate,** and **Hydrobromate** are crystalline salts.

**Medicinal Properties.**—Diuretic; useful in cases of dropsy due to heart disease.

**Dose.**—$\frac{1}{20}$ to $\frac{1}{15}$ grain dissolved in 60 minims of Water.

References.—*P.J.* xvii. 101, 229; xix. 1029; xx. 1017; *L.* '86, ii. 645; '87, ii. 691; '88, i. 241.

Ulexine temporarily masks the action of Strychnine.—*T.G.* '87, 280, 690.

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Not Official.

## ULMUS.

The dried inner bark of *Ulmus campestris,* deprived of its outer layer.

(Fr., Orme Champêtre and O. Fauve; Port., Olmo; U.S., Ulmus Fulva, Slippery Elm.)

**Medicinal Properties.**—Bitter, demulcent, slightly tonic, astringent and diuretic.

### Preparation.

**DECOCTUM ULMI.** — Elm Bark cut small, 1; Distilled Water, 8; boil 10 minutes, strain and make up to 8.

**Dose.**—2 to 4 ounces, three or four times daily.

(U.S. (Mucilago Ulmi), 6 of Slippery Elm in 100; not in the others.)

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## UNGUENTA.

OINTMENTS.

The following are the Ointments of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

| | Proportion of active ingredients in the mass. |
|---|---|
| UNGUENTUM ACIDI BORICI. . . . . . . . . . . | 1 in 7. |
| UNGUENTUM ACIDI CARBOLICI . . . . . . . . | 1 in 19. |
| UNGUENTUM ACIDI SALICYLICI . . . . . . . . | 1 in 28. |
| UNGUENTUM ACONITINÆ . . . . . . . . . . | 1 in 60. |

| | | Proportion of active ingredients in the mass. |
|---|---|---|
| UNGUENTUM ANTIMONII TARTARATI | | 1 in 5. |
| UNGUENTUM ATROPINÆ | | 1 in 60. |
| UNGUENTUM BELLADONNÆ | (Extract) | 1 in 10. |
| UNGUENTUM CALAMINÆ | | 1 in 6. |
| UNGUENTUM CANTHARIDIS | about | 1 in 7. |
| UNGUENTUM CETACEI | | 1 in 5½. |
| UNGUENTUM CHRYSAROBINI | | 1 in 25. |
| UNGUENTUM CONII | (Juice) | 2 in 1. |
| UNGUENTUM CREASOTI | | 1 in 9. |
| UNGUENTUM ELEMI | | 1 in 5. |
| UNGUENTUM EUCALYPTI | | 1 in 5. |
| UNGUENTUM GALLÆ | | 1 in 6½. |
| UNGUENTUM GALLÆ CUM OPIO | (Opium) | 1 in 14½. |
| UNGUENTUM GLYCERINI PLUMBI SUBACETATIS | | 1 in 6⅓. |
| UNGUENTUM HAMAMELIDIS | (Liquid Extract | 1 in 10. |
| UNGUENTUM HYDRARGYRI | (Mercury) | 1 in 2. |
| UNGUENTUM HYDRARGYRI AMMONIATI | | 1 in 10. |
| UNGUENTUM HYDRARGYRI COMPOSITUM | (Mercury) | 1 in 4½. |
| UNGUENTUM HYDRARGYRI IODIDI RUBRI | | 1 in 28. |
| UNGUENTUM HYDRARGYRI NITRATIS | (Mercury) | 1 in 15½. |
| UNGUENTUM HYDRARGYRI NITRATIS DILUTUM | | 1 in 3. |
| UNGUENTUM HYDRARGYRI OXIDI RUBRI | | 1 in 8. |
| UNGUENTUM HYDRARGYRI SUBCHLORIDI | | 1 in 6½. |
| UNGUENTUM IODI | (Iodine) | 1 in 31. |
| UNGUENTUM IODOFORMI | | 1 in 10. |
| UNGUENTUM PICIS LIQUIDÆ | | 5 in 7. |
| UNGUENTUM PLUMBI ACETATIS | | 1 in 37½. |
| UNGUENTUM PLUMBI CARBONATIS | | 1 in 8. |
| UNGUENTUM PLUMBI IODIDI | | 1 in 8. |
| UNGUENTUM POTASSÆ SULPHURATÆ | | 1 in 15½. |
| UNGUENTUM POTASSII IODIDI | about | 1 in 8¾. |
| UNGUENTUM RESINÆ | | 1 in 3¾. |
| UNGUENTUM SABINÆ | about | 1 in 2. |
| UNGUENTUM SIMPLEX. | | |
| UNGUENTUM STAPHISAGRIÆ | about | 1 in 2¼. |
| UNGUENTUM SULPHURIS | | 1 in 5. |
| UNGUENTUM SULPHURIS IODIDI | | 1 in 15½. |
| UNGUENTUM TEREBINTHINÆ | (Oil) | 1 in 2⅛. |
| UNGUENTUM VERATRINÆ | | 1 in 63. |
| UNGUENTUM ZINCI | | 1 in 6½. |
| UNGUENTUM ZINCI OLEATI | | 1 in 2. |

Ointments which are not official are enumerated in the Index.

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**Not Official.**

## URETHANE.

$C_3H_7NO_2$.

The Ethylic Ether of Carbaminic Acid.

In colourless, prismatic crystals, with a peculiar cooling taste; free from odour. Melts at 48° to 50° C. Evolves Ammonia when boiled with Solution of Potash.

**Solubility.**—1 in 2 of Water; 1 in 1 of Rectified Spirit; 2 in 3 of Ether.

(Russ. and Swiss; not in the other Pharmacopœias.)

**Medicinal Properties.**—A pure hypnotic; has no anodyne properties.

**Dose.**—15 to 30 grs.

REFERENCES.—*B.M.J.* '85, ii. 611; '86, i. 343, 354; '86, ii. 108, 468; *T.G.* '88, 340. A weak hypnotic and very uncertain. *M.A.* '91, 4.

An antidote to Strychnine.—*B.M.J.* '86, ii. 176.

**SOMNAL.**—Ethylated Chloral-urethan, $C_{17}H_{12}Cl_3O_3N$. Melts at 42°C. Hypnotic.—*L.* '89, ii. 1024.

**Dose.**—30 grains.

## UVÆ.

### RAISINS.

*B.P.Syn.*—UVÆ PASSÆ.

The ripe fruit of the Grape Vine, *Vitis vinifera*, dried by the heat of the sun, or partly by the sun's heat and partly by artificial heat. Imported from Spain.

The Sultana Raisins are therefore excluded.

(Fr. Raisin; not in the other Pharmacopœias.)

**Medicinal Properties.**—Nutritious and demulcent. Principally used as a flavouring agent.

Contained in Tinct. Cardam. Comp., and Tinct. Sennæ.

## UVÆ URSI FOLIA.

### BEARBERRY LEAVES.

The dried leaves of *Arctostaphylos Uva-ursi*, from indigenous plants.

Contains a crystallisable glucoside, **Arbutin**, soluble in Water and Rectified Spirit.

(Austr., Belg., Dan., Dutch, Fr. (Busserole), Ger., Norw., Ital. and Port. (Uva Ursina), Russ., Span. (Gayuba), Swed., Swiss and U.S.; not in Hung.)

**Medicinal Properties.**—Astringent and tonic, with a direct influence on the kidneys and urinary organs.

**Dose.**—Of the powdered leaf, 10 to 30 grs.

### Preparation.

**INFUSUM UVÆ URSI.**

Bearberry Leaves, bruised, 1; boiling Distilled Water, 20: infuse one hour, and strain. =(1 in 20).

**Dose.**—1 to 2 oz.

In the 1864 Pharmacopœia the leaves were not ordered to be bruised; *when bruised*, the infusion is stronger, but a large deposit forms from the strained fluid.

(Fr. (Tisane), 1 in 100; not in the others; U.S. has a **solid** and a **Fluid Extract.**)

**Incompatibles.**—Iron salts, Lead salts, Nitrate of Silver, Vegetable Alkaloids, Gelatine.

# VALERIANÆ RHIZOMA.

VALERIAN RHIZOME.

*B.P.Syn.*—VALERIANÆ RADIX.

The dried rhizome and rootlets of *Valeriana officinalis,* collected in autumn from plants growing wild or cultivated in Britain.

That from wild plants growing on dry soil is preferred. It owes its properties to a volatile Oil and a volatile Acid, the salts of which (Valerianates) are not prepared from the root, but synthetically from Amylic Alcohol.

The bulk of the Valerian root used in this country is of foreign growth, and should either be allowed or expressly prohibited in B.P.

(In all the Pharmacopœias.)

**Medicinal Properties.**—It is a nervous stimulant and anti-spasmodic. Useful in hysteria and nervous diseases; also in chorea and epilepsy; and as an adjunct to tonics.

**Dose.**—10 to 30 grs. of the powder.

## Preparations.

### INFUSUM VALERIANÆ.

Valerian Rhizome, bruised, ¼ oz.; boiling Distilled Water, 10 oz.: infuse one hour, and strain. =(about 1 in 40).

**Dose.**—1 to 2 oz.

(Fr. Tisane, 1 in 100; Span., 1 in 138; not in the others.)

### TINCTURA VALERIANÆ.

Valerian Rhizome, in No 40 powder, 1; Proof Spirit, 8: macerate the Valerian forty-eight hours with 6 of the Spirit, agitating occasionally; pack in a percolator, let it drain, pour on the remainder of the Spirit; when it ceases to drop, press and filter, and add Proof Spirit to make 8. =(1 in 8).

**Dose.**—1 to 2 drms.

(Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed. and Swiss, 1 in 5; all by weight; U.S., 1 in 5, also **Fluid Extract** 1 in 1.)

### TINCTURA VALERIANÆ AMMONIATA.

Valerian Rhizome, in No. 40 powder, 1; Aromatic Spirit of Ammonia, 8: macerate the Valerian seven days, strain, press, filter, and add Aromatic Spirit of Ammonia to make 8. =(1 in 8).

**Dose.**—½ to 1 drm.

(Port, 1 in 5, by weight; U.S., 1 in 5; not in the others.)

## Not Official.

### TINCTURA VALERIANÆ ÆTHEREA.

(Belg., Dan., Ger., Hung., Norw., Span., Swed., and Swiss, Valerian 1, Spirit of Ether 5; Fr., Powdered Valerian 1, Ether (sp. g. ·758) 5, by percolation; Russ., Valerian 1, Alcohol (90°) 4, Ether (·728) 2; all by weight.)

**OLEUM VALERIANÆ.**—A yellow volatile Oil; sp. g. ·930—·960.

(Austr., Belg., Dutch, Hung., Port. and Swed.)

# VAPORES.

## INHALATIONS.

The following are the Inhalations of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

VAPOR ACIDI HYDROCYANICI.
VAPOR CHLORI.
VAPOR CONINÆ.
VAPOR CREASOTI.
VAPOR IODI.
VAPOR OLEI PINI SYLVESTRIS.

# VERATRI VIRIDIS RHIZOMA.

## GREEN HELLEBORE RHIZOME.

*B.P.Syn.*—VERATRI VIRIDIS RADIX.

The rhizome and rootlets of *Veratrum viride*, dried.

Collected in autumn in U.S. and Canada.

The principal alkaloidal constituent (about half) is **Cevadine,** the same base as is found in Cevadilla; **Jervine** and **Pseudojervine**, in about equal proportions, constituting the remainder.—*P.J.* ix. 986.

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Has been given to reduce arterial excitement in sthenic forms of fever, and to quiet spinal spasms; should be cautiously prescribed.

In cardiac hypertrophy with dropsy.—*L.* '87, i. 951.

### Preparation.

### TINCTURA VERATRI VIRIDIS.

Green Hellebore Rhizome, in No. 40 powder, 4; Rectified Spirit, 20: macerate the Hellebore with 15 of the Spirit forty-eight hours, agitating occasionally, pack it in a percolator, let it drain, pour on the remainder of the Spirit; when it ceases to drop, press, filter, and add Rectified Spirit to make 20. =(1 in 5).

**Dose.**—5 to 20 minims.

The best menstruum is 70 p. c. Alcohol (by volume), and the best process continuous percolation; the total alkaloid in *root* varies between ·16 and 1·2 p. c., and consequently in the *tincture* between ·032 and ·24 p. c.; **Jervine** constitutes on the average 30 p. c. of total alkaloid.—*C.D.* '92, ii. 651.

(U.S., American Hellebore, 4 in 10, also a **Fluid Extract** 1 in 1; not in the others.)

# VERATRINA.

## VERATRINE.

*B.P.Syn.*—VERATRIA.

An alkaloid, or mixture of alkaloids, obtained from Cevadilla, not quite pure; a process for its preparation is described in B.P.

The nomenclature of the alkaloids contained in this mixture has undergone modification. Wright and Luff assign to the crystallisable portion (called by Merck

"Veratrine") the name of **Cevadine,** as it yields on saponification Cevadic Acid, the name **Veratrine** being reserved for the base described by Couerbe, which yields Veratric Acid. Another base has been called **Cevadilline,** but the bulk of the alkaloid refuses to yield any crystallisable or otherwise definable compounds.

Pale grey, amorphous, pulverulent masses, powerfully irritating the nostrils, strongly and persistently bitter, and highly acrid and poisonous.

**Tests.**—It dissolves in Nitric Acid, yielding a yellow solution, and in Sulphuric Acid forming a deep-red solution, which exhibits a green fluorescence by reflected light. Warmed with Hydrochloric Acid, it dissolves with the production of a blood-red colour. Heated with access of air, it melts into a yellow liquid, and at length burns away, leaving no residue.

Veratrine with Sulphuric Acid first goes yellow and then bright red, the addition of a drop of Syrup darkens the red and gives it a purple colour; by exposure to air the purple becomes more blue. Sulphuric Acid with $\frac{1}{7}$ of its volume of Water is a better reagent.

**Solubility.**—Scarcely soluble in cold Water; 1 in 1000 of boiling Water; 1 in 3 of Rectified Spirit; 1 in 6 of Ether; 1 in 3 of Chloroform; sparingly in Glycerine; about 1 in 80 of Olive Oil; and readily in diluted Acids.

(In all the Pharmacopœias.)

**Medicinal Properties.**—A powerful emetic and drastic purgative. Rarely given internally. Used externally in neuralgia, in chronic swellings, stiffening or induration of the joints. It should not be used where the skin is broken.

**Antidotes.**—Emetic, stimulants, Coffee, warmth to the extremities. Recumbent position to be strictly maintained.—*Murrell.*

### Preparation.

#### UNGUENTUM VERATRINÆ.

Veratrine, 8 grs.; Hard Paraffin, $\frac{1}{4}$ oz.; Soft Paraffin, $\frac{3}{4}$ oz.; Olive Oil, 60 mins.: rub the Veratrine and the Oil together; melt the Hard and Soft Paraffins together, and when in cooling they begin to thicken, mix the whole thoroughly in a mortar until cold.

=(7 grs. in the oz.).

(U.S., 1 in 25; Russ., 1 in 50; Port. (Pomada), 1 in 50; not in the others.)

### Not Official.

**OLEATUM VERATRINÆ** (*U.S.*).—Veratrine, 2; Oleic Acid, 98; rub together, and heat on a water-bath until dissolved.

Squibb suggests that this should be made 10 per cent., as more likely to give relief in neuralgia.—*Ephemeris,* p. 164.

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### Not Official.

## VIBURNUM.

BLACK HAW.

The bark of *Viburnum prunifolium.*

(U.S.; not in the other Pharmacopœias.)

**Medicinal Properties.**—Sedative and tonic to the uterine nervous system. Recommended in cases of threatened abortion.

References.—*B.M.J.* '85, i. 987; '86, i. 489, 542, 641, 740, 973; '87, i. 1153.

### Preparation.

**EXTRACTUM VIBURNI PRUNIFOLII FLUIDUM** (*U.S.*).—Exhaust by percolation Viburnum (in No. 60 powder), 100 parts, with a mixture of Alcohol 3 and Water 1; reserve the first 85, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to measure 100.

## VINA.

WINES.

Medicated wines are of very ancient date, and were admitted into our earliest Pharmacopœias. Two only remain as representatives of the old Pharmacopœias—Vinum Antimonii and V. Ferri; the former was prepared by digesting 4 ounces of the Regulus of Antimony in powder with 3 pounds of "White" Wine (Pharmacopœia Londinensis, 1655). The latter (Vinum Chalybeatum) was made with Rhenish Wine and Iron filings.

The following are the Wines of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

| Dose. | | Proportion of active ingredient in the whole. |
|---|---|---|
| 60 to 120 mins. | VINUM ALOES | 1 in $26\frac{2}{3}$. |
| 5 to 60 mins. | VINUM ANTIMONIALE | 2 grs. to 1 oz. |
| | VINUM AURANTII | |
| 10 to 30 mins. | VINUM COLCHICI | (Corm) 1 in 5. |
| 1 to 4 drms. | VINUM FERRI | made with Iron Wire. |
| 1 to 4 drms. | VINUM FERRI CITRATIS | 8 grs. to 1 oz. |
| 5 to 40 mins. | VINUM IPECACUANHÆ | 1 in 20. |
| 10 to 40 mins. | VINUM OPII | Ext. Opium 1 in 20. |
| $\frac{1}{2}$ to 1 oz. | VINUM QUININÆ | 1 gr. in 1 oz. |
| 60 to 120 mins. | VINUM RHEI | 1 in $13\frac{1}{3}$. |
| | VINUM XERICUM. | |

## VINUM XERICUM.

SHERRY.

A pale brown Spanish Wine, containing about seventeen per cent. of Alcohol.

Unless good sound Sherry is used, the preparations are apt to spoil by keeping.

All Medicinal Wines are made with Sherry, except Vin. Ferri Citratis and Vinum Quininæ, which are made with British Orange Wine.

For the amount of Alcohol in the several wines most commonly drunk in England, *see* "Spiritus."

### Not Official.

**VINUM XERICUM DETANNATUM** (*B.P.C.*).—Sherry, 1 gal.; Gelatine, cut small, 2 oz.; macerate together for fourteen days, and decant.

Not Official.

## VINCA MAJOR.

GREAT PERIWINKLE.

An **infusion** made of 2 oz. of dried herb to 20 oz. boiling water, and strained when cold, is powerfully astringent.

**Dose.**—A wineglassful drunk as frequently as required will arrest menorrhagia when other remedies have failed.

(Fr., Pervenche Grande; not in the other Pharmacopœias.)

**EXTRACTUM VINCÆ MAJORIS LIQUIDUM.**—Made from the expressed juice of the plant of such strength that 1½ drms. are equal to 2 oz. of the infusion.

**Dose.**—1 to 2 drms. in water.

The Fluid Extract keeps well, and is the best to prescribe.

Not Official.

## YERBA SANTA.

The leaves of *Eriodictyon Californicum.*

They contain 30 to 40 p.c. of a gum-resin.

Recommended in acute bronchitis.—*L.M.R.* '82, 47.

**Fluid Extract**, 1 in 1, made with strong Alcohol; dose, 10 to 60 minims.

## ZINCUM.

ZINC.

Zn, eq. 65.

Sp. g. 7·1; fuses at 773° F. A bluish-white metal, of peculiar taste and of a perceptible smell when rubbed; laminated, and with a crystalline fracture.

It occurs native, as a Sulphide or as a Carbonate, and is separated from impurities by sublimation.

The characteristic reaction of Zinc in solution is a white gelatinous precipitate with Ammonia or Carbonate of Ammonium, soluble in excess to a solution which yields a white precipitate with Sulphuretted Hydrogen or an alkaline Sulphide.

(Ital., Russ. and U.S.)

## ZINCUM GRANULATUM.

GRANULATED ZINC.

Fuse Zinc of Commerce in an earthen crucible, heated to a sufficient degree to melt the Zinc, but not to produce combustion; pour it in a very thin stream into a bucket of cold Water; afterwards dry the Zinc.

Used to prepare Liquor Zinci Chloridi, Zinci Chloridum, Zinci Sulphas.

The British Pharmacopœia contains the following salts of Zinc:—

ZINCI ACETAS.
ZINCI CARBONAS.
ZINCI CHLORIDUM.
ZINCI OXIDUM.

ZINCI SULPHAS.
ZINCI SULPHOCARBOLAS.
ZINCI VALERIANAS.

**Incompatibles** of Zinc Salts are—Alkalies and their Carbonates, Lime Water, Astringent Vegetable Infusions or Decoctions, and Milk.

**Antidotes.**—In case of poisoning with the salts of Zinc, Carbonate of Sodium or Carbonate of Potassium in large quantities dissolved in warm Water, Milk and Eggs freely, Tannic Acid or Strong Tea, Laudanum, Linseed Meal Poultices to abdomen. If much pain in the abdomen, an enema of gruel, or starch and water may be given. —*Murrell.*

## ZINCI ACETAS.

ACETATE OF ZINC.

$Zn(C_2H_3O_2)_2 . 2H_2O$, eq. 219.

Obtained by dissolving Carbonate of Zinc in a slight excess of Acetic Acid, and crystallising.

Thin, translucent, and colourless crystalline plates, of pearly lustre; it evolves Acetic Acid when decomposed by Sulphuric Acid; its aqueous solution is precipitated pure white by Sulphuretted Hydrogen.

The commercial salt as a rule is slightly basic, and does not give a clear solution in Water without the assistance of a little added Acetic Acid.

**Solubility.**—10 in 25 of Water; 4 in 1 of boiling Water; 1 in 40 of Rectified Spirit; 1 in 3 of boiling Rectified Spirit.

**Tests.**—A dilute watery solution is not affected by Chloride of Barium or by Nitrate of Silver (absence of Sulphates and Chlorides); and when slightly acidulated with Hydrochloric Acid is not precipitated by Sulphuretted Hydrogen (absence of Cadmium and Lead). After it has been boiled for a few minutes with a little Nitric Acid, it yields with Ammonia a white precipitate, entirely soluble without colour in an excess of the reagent (absence of Iron).

(Belg., Fr., Ger., Hung., Port., Russ., Span. and U.S.; not in the others.)

**Medicinal Properties.**—Astringent. Similar to the Sulphate.

**Dose.**—1 to 2 grs. as a tonic, 10 to 20 grs. as an emetic.

### Not Official.

**LOTIO ZINCI ACETATIS.**—Acetate of Zinc, 2 grs.; Water, 1 oz.: mix.

An astringent **collyrium** in ophthalmia, or as an **injection** in gonorrhœa after the acute stage has passed.

Tincture or Wine of Opium causes no precipitate with this Lotion.

A frequently prescribed substitute for this solution is a mixture of Zinc Sulphate and Lead Acetate which decompose each other with formation of soluble Zinc Acetate and insoluble Lead Sulphate.

### Not Official.

## ZINCI BROMIDUM.

A whitish granular powder, very deliquescent.

**Solubility.**—4 in 1 of Water; 2 in 1 of Rectified Spirit.

(Span. and U.S.; not in the others.)

**Dose.**—2 grs. three times a day for epilepsy.

## ZINCI CARBONAS.

CARBONATE OF ZINC.

$ZnCO_3(Zn2HO)_2, H_2O$, eq. 341.

Prepared Officially by boiling a mixed solution of Zinc Sulphate and Sodium Carbonate.

The anhydrous normal Carbonate, $ZnCO_3$, occurs native as **Calamine.** The composition of the precipitated hydrated Carbonate varies much according to the conditions under which it is formed.

A white, tasteless, inodorous powder, insoluble in Water; soluble with effervescence and without residue, in diluted Nitric Acid.

**Tests.**—Its solution in Diluted Nitric Acid is not precipitated by Chloride of Barium (indicating absence of Sulphate), or Nitrate of Silver (absence of Chloride), and gives with Carbonate of Ammonium a white precipitate (Carbonate of Zinc), entirely soluble without colour in an excess of the reagent forming a solution, which is precipitated white by Sulphydrate of Ammonium (absence of Iron).

(U.S., Zinci Carbonas Præcipitatus; not in the others.)

## ZINCI CHLORIDUM.

CHLORIDE OF ZINC.

$ZnCl_2$, eq. 136.

Obtained by evaporating Liquor Zinci Chloridi to such a consistence that it solidifies on cooling.

Colourless opaque rods or tablets, very deliquescent and caustic.

As the Official method of preparing the Liquor results in a basic solution, the solid Chloride must be still more so. This is why the commercial salt on being treated with Water leaves a quantity of white Oxychloride insoluble.

**Solubility.**—10 in 4 of Water; 1 in 1 of Rectified Spirit; freely in Ether; 1 in 4 (nearly) of Glycerine.

**Tests.**—Its watery solution is not affected by Chloride of Barium (indicating absence of Sulphuric Acid), or by Oxalate of Ammonium (absence of Calcium), and is not tinged blue by the Ferrocyanide or Ferricyanide of Potassium (absence of Iron). Ammonia throws down a white precipitate entirely soluble in an excess of the reagent.

(Austr., Ger., Hung., Russ. and Swiss, Zincum Chloratum; Belg., Chloruretum Zinci; Dan., Norw. and Swed., Chloretum Zincicum; Fr., Chlorure de Zinc; Ital., Cloruro di Zinco; Port., Chloreto de Zinco; Span., Cloruro Zincico; U.S., Zinci Chloridum; not in Dutch.)

**Medicinal Properties.**—Astringent, antiseptic and disinfectant. Seldom given internally. Externally, applied as a **caustic** to indolent and malignant ulcers alone or mixed with an equal proportion of Flour, Plaster of Paris, or Oxide of Zinc, to prevent its spreading (as it liquefies) beyond the edges of the ulcer. As a **lotion**, 20 grs. to 1 oz. of Water, it is an efficient substitute for Carbolic Acid, in syringing out offensive pus cavities, sinuses, foul ulcers, &c.

Solution for Gaiffe's galvanic apparatus, 60 grs. of Chloride of Zinc to 2 oz. of Distilled Water, filtered.

### Preparation.

**LIQUOR ZINCI CHLORIDI.**

Granulated Zinc, 8; Hydrochloric Acid, 22; Solution of Chlorine, *q. s.;* Carbonate of Zinc, ¼; Distilled Water, 10. Mix the Acid and Water in a porcelain dish, add the Zinc, and apply a gentle heat to promote the action until gas is no longer evolved; boil for half an hour, supplying the Water lost by evaporation, and allow the product to cool. Test a few drops of the resulting liquid for Iron or Lead by adding excess of Ammonia and then Sulphydrate of Ammonium, when a black precipitate is produced if either is present. In the latter case filter the remainder into a bottle, and add solution of Chlorine by degrees, with frequent agitation, until the fluid acquires a permanent odour of Chlorine. Add the Carbonate of Zinc, in small quantities at a time, and with renewed agitation, until a brown sediment appears, and the whole of the Iron or Lead is thus precipitated.

Filter the liquid into a porcelain basin, and evaporate until it is reduced to the bulk of 20. If no Iron or Lead be present, filter and evaporate to 20 at once.

A colourless fluid, with an astringent and sweetish taste. Sp. g. 1·460.

When made as above the solution will be basic and precipitate Oxychloride on dilution with Water. It should be evaporated rather lower, then neutralised with Hydrochloric Acid (so that it will cease to precipitate on being diluted with ten volumes of Water, or when this diluted solution just reddens Methyl Orange), and finally made up to 20.

When finished without loss the above quantities will yield a solution sp. g. about 1·53. For details and an improved formula of **Chlor-Zinc Iodine** (**Schulze's Solution**) *see P.J.*, xxiii. 648.

Should answer to the tests of purity for Zinci Chloridum.

(U.S. sp. g. 1·535; not in the other Pharmacopœias.)

(Sir W. Burnett's Disinfecting Solution, sp. g. 2·000.)

**Antidotes.**—In case of poisoning with Chloride of Zinc, *see* Zincum, page 540.

### Not Official.

**CHLORIDE OF ZINC POINTS.**—Chloride of Zinc fused and run into conical moulds; preserved in glass tubes.

Darts of Chloride of Zinc have been used in the treatment of Anthrax.—*B.M.J.* '87, ii. 644.

**COMPOUND CHLORIDE OF ZINC POINTS.**—Chloride of Zinc, 1; Oxide of Zinc, 1; Wheat Flour, 2; Water to make a stiff paste, which is formed into caustic points.

**LOTIO ZINCI CHLORIDI** (*L.O.H.*).—Chloride of Zinc, 1 gr.; Distilled Water, 1 oz.

**PASTA ZINCI CHLORIDI.**—Chloride of Zinc and Flour, equal parts; Glycerine, *q.s.*; rub the Chloride of Zinc into a thin paste with Water, then add the Flour; mix well and make into a thick paste with Glycerine.—*London Hosp.*

**PASTA ZINCI CHLORIDI CUM OPIO.**—Chloride of Zinc Paste, 1 oz.; Extract of Opium, 20 grs.; rub the Extract smooth with a few drops of Water and then mix thoroughly with the Paste.—*London Hosp.*

**PULVIS ZINCI CHLORIDI COMP.**—Oxide of Zinc, mixed with an equal weight of Chloride of Zinc, will preserve the latter dry enough to blow through a tube into any cavity required, and may be so kept in a bottle for a long time.

Not Official.

## ZINCI NITRAS.

**Medicinal Properties.**—Used as a caustic in the place of Chloride of Zinc, it penetrates deeper and produces less pain.

It can be made into a **paste** in the same way as Chloride of Zinc.

## ZINCI OXIDUM.

OXIDE OF ZINC.

ZnO, eq. 81.

Prepared as in B.P. by ignition of the Carbonate it forms a soft, nearly white, tasteless, and inodorous powder, becoming pale yellow when heated.

A light, pure white bulky variety, obtained by combustion of Metallic Zinc, is also mentioned in B.P., but apparently with the idea that it should not be used.

**Tests.**—Dissolves without effervescence in Diluted Nitric Acid, forming a solution which is not affected by Chloride of Barium (absence of Sulphates), or Nitrate of Silver (absence of Chlorides), or Diluted Sulphuric Acid* (absence of Lead), and gives, with Carbonate of Ammonium, a white precipitate which dissolves entirely without colour in an excess of the reagent, forming a solution which is precipitated white by Sulphydrate of Ammonium.

(In all the Pharmacopœias; Fr. by the dry as well as the humid process.)

**Medicinal Properties.**—Internally as a tonic, especially in spasmodic affections. Externally, an astringent application in eczema and slight excoriations and ulcerations, in the form of **ointment** or **paste**; also absorbent as a **dusting powder** when mixed with Starch.

**Dose.**—2 to 10 grs.

Can be made into pills with Glucose.

### Preparations.

**OLEATUM ZINCI.**

Oxide of Zinc, 1; Oleic Acid (by weight), 9; stir the Oxide with the Oleic Acid, and allow the mixture to stand for two hours, then heat on a water-bath until the Oxide is dissolved.

**UNGUENTUM ZINCI.**

Oxide of Zinc, in very fine powder, 80 grs.; Benzoated Lard, 1 oz. Add the Oxide to the melted Lard, and stir till cold. =(1 in $6\frac{1}{2}$).

(Austr., 1 in $7\frac{1}{2}$; Belg., Dan., Dutch, Fr. (Pommade), Ger., Hung., Norw., Russ. and Swiss, 1 in 10; Span., 1 in 16; U.S., 1 in 5; not in Ital., Port. or Swed.)

Applied to the feet once in twenty-four hours, prevents the unpleasant odour of perspiration.

**UNGUENTUM ZINCI OLEATI.**

Oleate of Zinc, 1; Soft Paraffin, 1; mix by the aid of a little heat, and stir till nearly cold.

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* Lead is very frequently present in quantities not detected by this test.

Not Official.

**DUSTING POWDER.**—Oxide of Zinc, 3; Salicylic Acid (in fine powder), 1; Starch, 12.

**LASSAR'S PASTE.**—Oxide of Zinc, 24; Starch, 24; Salicylic Acid, 2; Soft Paraffin, 50. Used in eczema.

**ZINCI OLEAS** (Shoemaker's).—Acetate of Zinc, 180 grs.; dissolve in cold Water 40 oz. Add slowly 20 oz. of a **Solution of Oleate of Sodium,** made by dissolving powdered Castile Soap, 1 oz. in 20 oz. of Water; wash the precipitate with cold Water, collect, and dry.

It forms a solid cake, easily powdered, and melting at about 175° F.

Oleate of Sodium Solution of the above strength is also used to precipitate the Oleates of Bismuth, Copper, and Lead.

**ZINC OXIDE PLASTER MULLS** (Unna).—Containing ½ grain and 1 grain to the sq. inch.

**ZINC AND SALICYLIC PLASTER MULL** (Unna).—Containing Oxide of Zinc ½ grain and Salicylic Acid ¼ grain to the sq. inch.

**ZINC GELATINE** (Unna).—Oxide of Zinc, 10; Gelatine, 10; Glycerine, 20; Water, 20.

Not Official.

## ZINCI PERMANGANAS.

In reddish-purple crystalline masses.

**Solubility.**—About 1 in 3 of Water, generally with a slight residue.

An **injection** in chronic urethritis, 1 grain in 8 oz. of Water.—*B.M.J.* '89, i. 1458.

Not Official.

## ZINCI PHOSPHIDUM.

Minutely crystalline friable fragments, or a greyish-black powder, containing about 24 p.c. of Phosphorus, corresponding to the formula $Zn_3P_2$.

**Solubility.**—Insoluble in Water or Rectified Spirit. Soluble in Acids with evolution of Phosphuretted Hydrogen, which is not spontaneously inflammable.

(Fr., Phosphure de Zinc; U.S.; not in the others.)

**Medicinal Properties.**—Strongly recommended as a substitute for Phosphorus.

**Dose.**—1/20 to ¼ grain, given in a **pill** with Sugar of Milk and Glucose.

## ZINCI SULPHAS.

### SULPHATE OF ZINC.

$ZnSO_4.7H_2O$, eq. 287.

Prepared by saturating diluted Sulphuric Acid with excess of Zinc and crystallising.

In colourless, transparent, prismatic crystals, with a strong metallic styptic taste.

**Solubility.**—10 in 7 of Water. Insoluble in Rectified Spirit.

**Tests.**—Its watery solution is not tinged purple by Tincture of Galls—indicating absence of Iron; and when acidulated with Sulphuric or Hydrochloric Acid, gives no precipitate with Sulphuretted Hydrogen

—indicating absence of Lead, Cadmium, and Copper. After it has been boiled for a few minutes with a little Nitric Acid, it yields with Ammonia a white precipitate, which is entirely soluble without colour in an excess of the reagent, and from which Alkaline Sulphides precipitate white Sulphide of Zinc.

(Austr., Ger., Hung., Russ. and Swiss, Zincum Sulfuricum; Belg., Sulphas Zinci; Dan., Dutch, Norw., and Swed., Sulphas Zincicus; Fr., Sulfate de Zinc; Ital., Solfato di Zinco; Port., Sulfato de Zinco; Span., Sulfato Zincico; U.S., Zinci Sulphas.)

**Medicinal Properties.**—In small doses tonic and astringent; chiefly employed in spasmodic diseases, as epilepsy, chorea, tussis, &c.; in large doses a prompt emetic. As an astringent **injection** in leucorrhœa and in the less acute stages of gonorrhœa; as a **collyrium** in ophthalmia.

**Dose.**—As a tonic or astringent, 1 to 2 grs.; emetic, 10 to 30 grs.

Tincture or Wine of Opium causes no precipitate with Solutions of Zinc.

### Not Official.

**INJECTIO ZINCI SULPHATIS.**—Sulphate of Zinc, 3 grs.; Water 1 oz. For gonorrhœa and leucorrhœa.

**LOTIO RUBRA.**—Sulphate of Zinc, 2 grs.; Compound Tincture of Lavender, 10 mins.; Water to 1 oz. A stimulant to indolent ulcers.

**LOTIO ZINCI SULPHATIS** (*L.O.H.*).—Sulphate of Zinc, 1 gr.; Distilled Water, 1 oz. Used in ophthalmia.

**CADMII SULPHAS.**—Colourless crystals, readily soluble in Water, insoluble in Alcohol. Has been used as an astringent in the place of Sulphate of Zinc.

(Belg., Fr. and Port.; not in the others.)

## ZINCI SULPHOCARBOLAS.

### SULPHOCARBOLATE OF ZINC.

$Zn(C_6H_5SO_4)_2, H_2O$, eq. 429.

May be obtained by heating a mixture of Carbolic Acid and Sulphuric Acid, saturating the product with Oxide of Zinc, evaporating and crystallising.—*Brit. Pharm.*

Prepared in this way it will contain a quantity of Sulphate.

Transparent tabular crystals.

**Solubility.**—1 in 2 of Water; 3 in 1 of boiling Water; 1 in 2½ of Rectified Spirit.

**Tests.**—The aqueous solution is coloured violet by Perchloride of Iron, and gives a white precipitate with Sulphydrate of Ammonium; it is not at once* rendered turbid, or is rendered only faintly turbid by Chloride of Barium (trace of Sulphate), and is not precipitated by Oxalate of Ammonium (absence of Barium and Calcium).

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* Sulphocarbolate of Zinc or Sodium, if it contain Sulphate, will react at once with $BaCl_2$, otherwise not at all. There is no gradual decomposition giving rise to turbidity.

(Dutch, Sulphophenylas Zincicus; Russ., Zincum Sulfocarbolicum; Swiss, Zincum Sulfophenolicum; not in the others.)

**Medicinal Properties.**—Astringent and antiseptic.

For a **spray** to the throat, 5 grs. to the ounce of Water; for a **collunarium**, 2 grs. to the ounce; for **vaginal injection**, 60 grs. in a pint of Water, for leucorrhœa or gonorrhœa.

## ZINCI VALERIANAS.

### VALERIANATE OF ZINC.

$Zn(C_5H_9O_2)_2$, eq. 267.

In bright white, pearly, tabular crystals, with a feeble odour of Valerianic Acid and a metallic taste.

**Solubility.**—1 in 120 of Water; 1 in 60 of Rectified Spirit; 1 in 500 of Ether.

**Tests.**—Its solution in hot Water is only faintly precipitated by Chloride of Barium (trace of Sulphate.) It gives, when heated with Diluted Sulphuric Acid, a distillate (Valerianic Acid), which, when mixed with solution of Acetate of Copper, does not immediately affect the transparency of the fluid (indicating absence of Butyric Acid), but forms after a little time oily drops, which gradually pass into a bluish-white crystalline deposit (Valerianate of Copper).

Butyric Acid if present will form an immediate crystalline precipitate.

The theoretical percentage of ZnO is 30·3 (with $H_2O$ 28·4). The examination of a number of commercial samples is given (*P.J.* xxiii., 190), the yield being from 21 to 64 p. c. of Oxide, and suggesting a minimum standard of 26 p. c. All the samples examined showed Butyric Acid by the copper test. The commercial "præcip." generally contains a quantity of Oxide, but pure samples can occasionally be obtained.

(Belg., Dutch, Fr., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Austr., Dan. or Ger.)

**Medicinal Properties.**—Antispasmodic, chiefly used in chorea, epilepsy, and in various neuralgic and hysterical affections.

**Dose.**—1 to 6 grs. or more, in **pill**, with Extract of Gentian or Glucose.

**Incompatibles.**—All Acids, soluble Carbonates, most metallic salts, vegetable astringents.

## ZINGIBER.

### GINGER.

The scraped and dried rhizome of *Zingiber officinale.*

From plants cultivated in the West Indies, India, and other countries.

(In all the Pharmacopœias; Fr., Gingembre; Ital., Zenzero; Port., Gengibre; Span., Jengibre.)

**Medicinal Properties.**—Aromatic stimulant and carminative. It is given in dyspepsia, flatulency, and as an adjunct to purgative medicines.

**Dose.**—In powder, 10 to 20 grs.

Contained in Conf. Opii, Conf. Scammonii, Inf. Sennæ, Pil. Scillæ Comp., Pulv. Cinnam. Comp., Pulv. Jalapæ Comp., Pulv. Opii Comp., Pulv. Rhei Comp., Pulv. Scammonii Comp., Vin. Aloes.

## Preparations.

### SYRUPUS ZINGIBERIS.

Strong Tincture of Ginger, 6 drms.; Syrup, sufficient to produce 20 oz.: mix with agitation. =(about 1 in 27).

**Dose.**—1 to 4 drms.

(Swed., 1 (rhizome) in 28, by weight; U.S., 3 (Fluid Extract) in 100; not in the others.)

### TINCTURA ZINGIBERIS.

Ginger, bruised, 1; Rectified Spirit, 8: macerate the Ginger forty-eight hours in 6 of the Spirit, agitating occasionally; pack in a percolator, let it drain, pour on the remaining Spirit, and when it ceases to drop, press, filter, and add Rectified Spirit to make 8. =(1 in 8).

Better prepared by dilution of the Strong Tincture.

**Dose.**—10 to 60 mins.

(Belg., Fr., Ger., Hung., Port., Russ., Swiss and U.S., 1 in 5; all by weight except U.S.; not in the others.)

### TINCTURA ZINGIBERIS FORTIOR. *B.P.Syn.*—ESSENCE OF GINGER.

Ginger, in powder, 10; Rectified Spirit, sufficient to percolate 20. Pack the Ginger tightly in a percolator, and pour over it carefully half of the Spirit, and after two hours add the remainder and as much more as is required to percolate 20. =(1 in 2).

**Dose.**—5 to 20 minims.

(Not in the other Pharmacopœias.)

Contained in Syrup of Ginger = (about 1 in 27).

By repercolation a fluid Extract 1 in 1, or even 2 in 1, can be readily prepared. Our **Essence of Ginger** has always been twice the B.P. strength.

## Not Official.

**OLEORESINA ZINGIBERIS** (*U.S.*) *Syn.*—GINGERINE.

Ginger, in No. 60 powder, 10; Stronger Ether, *q. s.* Press the Ginger firmly in a percolator, pour on the Ether, and when that has been absorbed, add Ether until the Ginger is exhausted. Recover the greater part of the Ether by distillation, and expose the residue to air until the remaining Ether has evaporated.

(Not in the other Pharmacopœias.)

# THE EFFERVESCENT PREPARATIONS

CONTAINED IN THE

# BRITISH PHARMACOPŒIA

ARE :—

| | |
|---|---|
| Citro-tartrate of Sodium | |
| Phosphate of Sodium | contains 50 p. c. of Phosphate of Sodium. |
| Sulphate of Magnesium | ,, 50 p. c. of Sulphate of Magnesium. |
| ,, ,, Sodium | ,, ,, ,, ,, Sodium. |

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## Not Official.

The following unofficial preparations are also made; the amount given in grains is the quantity of active ingredient contained in 60 grains of the preparation :—

| | |
|---|---|
| Antifebrin | 5 grains. |
| Antipyrin | 5 ,, |
| ,, | 10 ,, |
| Benzoate of Lithium | 5 ,, |
| ,, Potassium | 5 ,, |
| Bicarbonate of Potassium | 5 ,, |
| ,, ,, ,, | 10 ,, |
| Bismuth Ammonio-Citrate | 2 ,, |
| Bromide of Ammonium | 10 ,, |
| ,, ,, Iron | 4 ,, |
| ,, ,, Potassium | 5 ,, |
| ,, ,, ,, | 10 ,, |
| ,, ,, Sodium | 10 ,, |
| ,, ,, Strontium | 5 ,, |
| Carbonate of Iron (Blaud's) | 2 ,, |
| ,, ,, Lithium | 5 ,, |
| Citrate of Caffeine | 1 grain. |
| ,, ,, ,, | 3 grains. |
| ,, ,, ,, | 5 ,, |
| ,, ,, ,, | 10 ,, |
| ,, ,, Iron | 2 ,, |
| ,, ,, ,, and Quinine | 1 grain. |
| ,, ,, ,, ,, ,, | 2 grains. |
| ,, ,, Lithium | 2 ,, |
| ,, ,, ,, | 5 ,, |
| Citrate of Potassium | 10 grains. |
| ,, ,, Quinine | 1 grain. |
| ,, ,, ,, | 3 grains. |
| Exalgine | 2 ,, |
| ,, | 5 ,, |
| Hydrobromate of Caffeine | 1 grain. |
| ,, ,, ,, | 3 grains. |
| ,, ,, Quinine | 2 ,, |
| Hydrochloride of Phenocoll | 5 ,, |
| Hypophosphite of Sodium | 4 ,, |
| Iodide of Iron | 1 grain. |
| ,, ,, Potassium | 2 grains. |
| ,, ,, Sodium | 1½ ,, |
| Nitrate of Cerium | 2 ,, |
| Oxalate ,, ,, | 2 ,, |
| Phenacetin | 5 ,, |
| ,, | 10 ,, |
| Piperazine | 5 ,, |
| ,, and Phenocoll | 5 grains each. |
| Salicylate of Lithium | 2 grains. |
| ,, ,, ,, | 5 ,, |
| ,, ,, Potassium | 10 ,, |
| ,, ,, Sodium | 5 ,, |
| ,, ,, ,, | 10 ,, |

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THE FOLLOWING PREPARATIONS ARE MADE TO REPRESENT THE

## MINERAL WATERS

IN A GRANULAR AND EFFERVESCENT FORM.

Buda-Pesth Salts (Hunyadi Janos)
Carlsbad Salts
Cheltenham
Friedrichshall
Harrogate
Kissingen
Kreuznach
Leamington
Marienbad
Mondariz
Pullna
Seltzer
Vichy
Wiesbaden

# APPENDIX.

## I. ARTICLES EMPLOYED IN CHEMICAL TESTING.

ACETATE OF SODIUM. *See* p. 485.

BENZOL.

$(C_6H_6.)$

A colourless volatile liquid, obtained from coal tar. Specific gravity ·85.

BENZOLATED AMYLIC ALCOHOL.

Mix together 3 volumes of Benzol and 1 of Amylic Alcohol; decant the supernatant fluid from any deposited Water.

CHLORIDE OF BARIUM.

$(BaCl_2 . 2H_2O.)$

COPPER FOIL.

Pure Metallic Copper, thin and bright.

FERRICYANIDE OF POTASSIUM. *B.P.Syn.*—RED PRUSSIATE OF POTASH.

$K_6Fe_2C_{12}N_{12}$.

*Test.*—Its aqueous solution gives no precipitate with a dilute solution of a pure Ferric salt.

GOLD, FINE.

Gold, free from metallic impurities.

HYPOSULPHITE OF SODIUM. *Syn.* THIOSULPHATE OF SODIUM.

$(Na_2S_2O_3, 5H_2O.)$

*Test.*—24·8 grains decolourise 1000 grain-measures of the volumetric solution of Iodine.

INDIGO.

$(C_8H_5NO.)$

A blue pigment prepared from various species of *Indigofera.*

ISINGLASS.

The swimming-bladder or sound of various species of *Acipenser*, prepared and cut into fine shreds.

LITMUS.

A blue pigment prepared from various species of *Roccella.*

LITMUS PAPER, BLUE.

Unsized white paper steeped in Solution of Litmus, and dried by exposure to the air.

LITMUS PAPER, RED.

Unsized white paper steeped in Solution of Litmus which has been previously reddened by the addition of a very minute quantity of acid, and dried by exposure to the air.

MOLYBDATE OF AMMONIUM.

$((NH_4)_2MO_4.)$

A solution of this salt in Liquor Ammoniæ, with subsequent addition of excess of Nitric Acid, is a delicate reagent for Phosphoric Acid, giving on warming an abundant yellow precipitate.

### OXALIC ACID OF COMMERCE.

Oxalic Acid ($H_2C_2O_4$, $2H_2O$.), not quite pure.

### OXALATE OF AMMONIUM.

( $(NH_4)_2C_2O_4$, $H_2O$.)

Take of Oxalic Acid, 1 oz.; boiling Distilled Water, 8 fl. oz., Carbonate of Ammonium, a sufficiency: dissolve the Oxalic Acid in the Water, neutralise the solution with the Carbonate of Ammonium at, finally, a boiling temperature; filter it while still hot, and set it aside that crystals may form.

### PETROLEUM SPIRIT. *B.P.Syn.*—BENZOLINE; PETROLEUM ETHER.

A colourless, very volatile, and highly inflammable liquid obtained from Petroleum, and consisting of a mixture of the lower members of the Paraffin or Marsh-gas series of Hydrocarbons. Boiling point 122° to 140° F. (50° to 60° C.) Sp. g. about ·670 to ·700.

### PHENOL-PHTHALEIN.

Produced by the reaction of Phenol and Phthalic Anhydride. Its Tincture yields an intense red colour with Potash or Soda, hence may be used as an indicator of the termination of volumetric reactions, especially those with organic acids.

### PLATINUM BLACK.

Platinum in a state of minute division, obtained by adding excess of Carbonate of Sodium and some Sugar to solution of Perchloride of Platinum, and boiling till a black precipitate is formed, which is washed and dried.

### PLATINUM FOIL.

### SUBACETATE OF COPPER OF COMMERCE.

Verdigris.

### SULPHATE OF COPPER, ANHYDROUS.

($CuSO_4$.)

Sulphate of Copper deprived of its Water by a heat of 400° F. (204·4° C.).

A yellowish-white powder, which becomes blue when moistened with Water.

### SULPHIDE OF IRON.

($FeS$.)

Prepared by combining its elements in proper proportions by the aid of heat. Small quantities may be produced by applying the end of a rod of Iron, heated to whiteness at a blacksmith's forge, to the end of a roll of Sulphur, and allowing the Sulphide of Iron, as it is formed, to run into a vessel of Water.

### SULPHURETTED HYDROGEN.

($H_2S$.)

Take of Sulphide of Iron, $\frac{1}{2}$ oz.; Water 4 fl. oz.; Sulphuric Acid, a sufficiency: place the Sulphide of Iron and the Water in a gas-bottle closed with a cork perforated by two holes, through one of which passes air-tight a funnel tube of sufficient length to dip into the Water, and through the other a tube for giving exit to the gas. Through the former pour from time to time a little of the Acid, so as to develop the Sulphuretted Hydrogen as it may be required.

When the gas is employed, either in chemical testing or in the preparation of Acidum Hydrobromicum Dilutum, it should be washed by passing it through a similarly fitted bottle containing Water.

TIN, GRANULATED.

Grain tin, reduced to small fragments by fusing and, immediately the tin is melted, pouring it in a thin stream into cold Water.

TURMERIC.

The dried Rhizome of *Curcuma longa.*

TURMERIC PAPER.

Unsized white paper steeped in Tincture of Turmeric, and dried by exposure to the air.

TURMERIC TINCTURE.

Take of Turmeric, bruised, 1 oz.; Rectified Spirit, 6 fl. oz.: macerate for seven days in a closed vessel, and filter.

## II. TEST SOLUTIONS.

SOLUTION OF ACETATE OF COPPER.

Take of Subacetate of Copper of Commerce, in fine powder, ½ oz.; Acetic Acid, 1 fl. oz.; Distilled Water, a sufficiency: dilute the Acid with ½ fl. oz. of the Water; digest the Subacetate of Copper in the mixture, at a temperature not exceeding 212° F. (100° C.), with repeated stirring, and continue the heat until a dry residue is obtained. Digest this in 4 oz. of boiling Distilled Water, and by the addition of more of the Water make up the solution to 5 fl. oz. Filter it.

SOLUTION OF ACETATE OF POTASSIUM.

Take of Acetate of Potassium, ½ oz.; Distilled Water, 5 fl. oz.: dissolve and filter.

SOLUTION OF ACETATE OF SODIUM.

Take of Acetate of Sodium, ½ oz.; Distilled Water, 5 fl. oz.: dissolve and filter.

SOLUTION OF ALBUMEN.

Take the White of one Egg; Distilled Water, 4 fl. oz.: mix by trituration in a mortar, and filter through clean tow first moistened with Distilled Water. This solution must be recently prepared.

SOLUTION OF AMMONIO-NITRATE OF SILVER.

Take of Nitrate of Silver, in crystals, ¼ oz.; Solution of Ammonia, ½ fl. oz., or a sufficiency; Distilled Water, a sufficiency: dissolve the Nitrate of Silver in 8 fl. oz. of Water, and to the solution add cautiously the Ammonia until the precipitate first formed is nearly dissolved. Clear the solution by filtration, and then add Distilled Water, so that the bulk may be 10 fl. oz.

SOLUTION OF AMMONIO-SULPHATE OF COPPER.

Take of Sulphate of Copper, in crystals, ½ oz.; Solution of Ammonia, a sufficiency; Distilled Water, a sufficiency: dissolve the Sulphate of Copper in 8 fl. oz. of Water, and to the solution add cautiously the Ammonia until the precipitate first formed is nearly dissolved. Clear the solution by filtration, and then add Distilled Water, so that the bulk may be 10 fl. oz.

SOLUTION OF AMMONIO-SULPHATE OF MAGNESIUM.

Take of Sulphate of Magnesium, 1 oz.; Chloride of Ammonium, ½ oz.; Solution of Ammonia, ½ fl. oz.; Distilled Water, a sufficiency: dissolve the Sulphate of Magnesium and Chloride of Ammonium in 8 fl. oz. of the Water and to the solution add the Ammonia, and as much Distilled Water as will make up the bulk to 10 fl. oz. Filter it.

### SOLUTION OF BORIC ACID.

Take of Boric Acid, 50 grs.; Rectified Spirit, 1 fl. oz.: dissolve and filter.

### SOLUTION OF BROMINE.

Take of Bromine, 10 minims; Distilled Water, 5 fl. oz: place the Bromine in a bottle furnished with a well-fitting stopper, pour on the Water, and shake several times. Keep it excluded from the light.

### SOLUTION OF CARBONATE OF AMMONIUM.

Take of Carbonate of Ammonium, in small pieces, ½ oz.; Solution of Ammonia, ¾ fl. oz.; Distilled Water, 10 fl. oz.: dissolve and filter.

### SOLUTION OF CHLORIDE OF AMMONIUM.

Take of Chloride of Ammonium, 1 oz.; Distilled Water, 10 fl. oz.: dissolve and filter.

### SOLUTION OF CHLORIDE OF BARIUM.

Take of Chloride of Barium, in crystals, 1 oz.; Distilled Water, 10 fl. oz.: dissolve and filter.

### SOLUTION OF FERRICYANIDE OF POTASSIUM.

Ferricyanide of Potassium, in crystals, ¼ oz.; Distilled Water, 5 fl. oz.; dissolve and filter.

### SOLUTION OF FERROCYANIDE OF POTASSIUM.

Ferrocyanide of Potassium, in crystals, ¼ oz.; Distilled Water, 5 fl. oz.: dissolve and filter.

### SOLUTION OF IODIDE OF POTASSIUM.

Take of Iodide of Potassium, 1 oz.; Distilled Water, 10 fl. oz.: dissolve and filter.

### SOLUTION OF ISINGLASS.

Take of Isinglass, in shreds, 50 grs.; Warm Distilled Water, 5 fl. oz.: mix and digest for half an hour on a water-bath with repeated shaking, and filter through clean tow moistened with Distilled Water.

### SOLUTION OF LITMUS.

Litmus, in powder, 1 oz.; Rectified Spirit, 10 fl. oz.; Distilled Water, 10 fl. oz.: boil the Litmus with 4 fl. oz. of the Spirit for one hour, and pour away the clear fluid; repeat this operation with 3 fl. oz. of the Spirit; and a third time with the remainder of the Spirit. Digest the residual Litmus in Distilled Water and filter.

### SOLUTION OF OXALATE OF AMMONIUM.

Take of Oxalate of Ammonium, ½ oz.; Warm Distilled Water, 20 fl. oz.: dissolve and filter.

### SOLUTION OF PERCHLORIDE OF GOLD.

Take of Fine Gold, reduced by a rolling machine to a thin lamina, 60 grs.; Nitric Acid, 1½ fl. dr.; Hydrochloric Acid, 7 fl. drs.; Distilled Water, a sufficiency: place the Gold in a flask with the Nitric Acid and 6 fl. drs. of the Hydrochloric Acid, first mixed with 4 fl. drs. of the Water, and digest until it is dissolved. Add to the solution the additional fluid dr. of Hydrochloric Acid, evaporate at a heat not exceeding 212° F. (100° C.) until acid vapours cease to be given off, and dissolve the Chloride of Gold thus obtained in 5 fl. oz. of Distilled Water. The solution should be kept in a stoppered bottle.

### SOLUTION OF PERCHLORIDE OF PLATINUM.

Take of Thin Platinum Foil, ¼ oz.; Nitric Acid, a sufficiency; Hydrochloric Acid, a sufficiency; Distilled Water, 7 fl. oz.: mix 1 fl. oz. of the

Nitric Acid with 4 fl. oz. of the Hydrochloric Acid, and 2 fl. oz. of the Water; pour the mixture into a small flask containing the Platinum, and digest with a little heat, adding more of the Acids mixed in the same proportion, should this be necessary, until the metal is dissolved. Transfer the solution to a porcelain dish, add to it 1 fl. drm. of Hydrochloric Acid, and evaporate on a water-bath until acid vapours cease to be given off. Let the residue be dissolved in the remaining 5 oz. of Distilled Water. Filter, and preserve it in a stoppered bottle.

SOLUTION OF PHOSPHATE OF SODIUM.

Take of Phosphate of Sodium, in crystals, 1 oz.; Distilled Water, 10 fl. oz.: dissolve and filter.

SOLUTION OF POTASSIO-CUPRIC TARTRATE. *See* p. 222.

SOLUTION OF POTASSIO-MERCURIC IODIDE. *B.P.Syn.*—NESSLER'S REAGENT.

Take of Iodide of Potassium, 270 grs.; Perchloride of Mercury, a sufficiency; Caustic Soda, 2 oz; Distilled Water, 20 oz.: dissolve the Iodide of Potassium and 100 grs. of the Perchloride of Mercury in 15 fl. oz. of boiling Distilled Water. To this fluid add more aqueous solution of the Perchloride of Mercury until the precipitate produced no longer continues to disappear on well stirring, and a slight permanent precipitate remains. Then add the Caustic Soda. When the latter has dissolved, add a little more of the aqueous solution of Perchloride of Mercury, shake and allow to settle, and dilute the whole with Distilled Water to the volume of 20 oz.

The solution should be kept in a stoppered bottle.

As the stopper is very likely to become fixed, it should be wiped over with a little Soft Paraffin.

SOLUTION OF STANNOUS CHLORIDE.

Take of Granulated Tin, 1 oz.; Hydrochloric Acid, 3 fl. oz.; Distilled Water, a sufficiency: dilute the Acid in a flask with 1 fl. oz. of the Water, and, having added the Tin, apply heat gently until gas ceases to be evolved. Add as much of the Water as will make up the bulk to 5 fl. oz., and transfer the solution, together with the undissolved Tin, to a bottle with an accurately ground stopper.

SOLUTION OF SULPHATE OF CALCIUM.

Take of Sulphate of Calcium, $\frac{1}{4}$ oz.; Distilled Water, 20 oz.: rub the Sulphate of Calcium in a porcelain mortar, for a few minutes, with 2 oz. of the Water, introduce the mixture thus obtained into a pint bottle containing the rest of the Water, shake well several times, and allow the undissolved Sulphate to subside. Filter.

SOLUTION OF SULPHATE OF INDIGO.

Take of Indigo, dry, and in fine powder, 5 grs.; Sulphuric Acid, 10 fl. oz.: mix the Indigo with 1 fl. drm. of the Sulphuric Acid in a small test-tube, and heat on a water-bath for an hour. Pour the blue liquid into the remainder of the Acid, agitate the mixture, and when the undissolved Indigo has subsided, decant the clear liquid into a stoppered bottle.

SOLUTION OF SULPHATE OF IRON.

Take of Granulated Sulphate of Iron, 10 grs.; Boiling Distilled Water, 1 fl. oz.: dissolve and filter. The solution should be recently prepared.

SOLUTION OF SULPHYDRATE OF AMMONIUM.

Take of Solution of Ammonia, 5 fl. oz.: put 3 fl. oz. of the Ammonia into a bottle, and conduct into this a stream of Sulphuretted Hydrogen so long as the gas continues to be absorbed, then add the remainder of the Ammonia, and transfer the solution to a green-glass bottle furnished with a well-ground stopper.

SOLUTION OF TARTARIC ACID.

Take of Tartaric Acid, in crystals, 1 oz.; Distilled Water, 8 fl. oz.; Rectified Spirit, 2 fl. oz.: dissolve the Tartaric Acid in the Water, add the Rectified Spirit, and preserve the solution in a stoppered bottle.

SOLUTION OF YELLOW CHROMATE OF POTASSIUM.

Take of Red Chromate of Potassium, 295 grs.; Bicarbonate of Potassium, 200 grs.; Distilled Water, 10 fl. oz.: dissolve the Red Chromate in the Water, and exactly neutralise the solution with the Bicarbonate, evolution of all Carbonic Acid being ensured by ebullition. Filter.

TINCTURE OF PHENOL-PHTHALEIN.

Take of Phenol-phthalein, 1 gr.; Proof Spirit, 500 grs.: dissolve. The solution should be colourless.

## III. TEST SOLUTIONS FOR VOLUMETRIC ESTIMATIONS.

The processes for volumetric estimations may be performed either with British or with metric weights and measures, and the solutions are so arranged that they will be of the same strength, and the same indications will be obtained in using them, whichever system is employed, without the *necessity* of altering any of the figures by which the quantities of the substances tested, or of the test solutions required in the process, are expressed.

According to the British system, the quantities of the substances to be tested are expressed in grains by weight, whilst the quantities of the test solutions employed in testing are expressed in grain-measures,—the grain-measure being the volume of a grain of Distilled Water.

According to the metric system, the quantities of the substances to be tested are expressed in grammes by weight, whilst the quantities of the test solutions employed in testing are expressed in cubic centimetres,—the cubic centimetre (C.C.) being the volume of a gramme of Distilled Water.

As the cubic centimetre bears the same relation to the gramme that the grain-measure bears to the grain, the one system may be substituted for the other with no difference in the results, excepting that, by the metric system, all the quantities will be expressed in relation to a weight (the gramme) which is rather more than fifteen (15·432) times greater than the British grain.

In practice it will be found convenient, in substituting metric for British weights and measures, to reduce the values of all the numbers to one-tenth, by moving the decimal points, and this has been done in the tables appended to the descriptions of the volumetric solutions. The quantities indicated in the Pharmacopœia, which in grains and grain-measures can be conveniently used, would be found inconveniently large if the same numbers of grammes and cubic centimetres were employed.

The following apparatus is required in the preparation and use of these solutions.

For British weights and measures:—

1. A flask which, when filled to a mark on the neck, contains exactly 10,000 grains of Distilled Water at 60° F. (15·5° C.). The capacity of the flask is therefore 10,000 grain-measures.

2. A graduated cylindrical jar which, when filled to 0, holds 10,000 grains of Distilled Water, and is divided into 100 equal parts.

3. A burette. A graduated glass tube which, when filled to 0, holds 1000 grains of Distilled Water, and is divided into 100 equal parts. Each part therefore corresponds to 10 grain-measures.

For metric weights and measures:—

1. A glass flask which, when filled to a mark on the neck, contains one litre or 1000 cubic centimetres.

2. A graduated cylindrical jar which, when filled to 0, contains one litre (1000 cubic centimetres), and is divided into 100 equal parts.

3. A burette. A graduated tube which, when filled to 0, holds 100 cubic centimetres, and is divided into 100 equal parts.

(One cubic centimetre is the volume of one gramme of Distilled Water at 4° C.=39·2° Fahr. 1000 cubic centimetres equal one litre.)

Volumetric solutions, before being used, should be shaken in order that they may be throughout of uniform strength. They should also be preserved in stoppered bottles. All measurements should be made at 60° Fahr. (15·5° C.).

## VOLUMETRIC SOLUTION OF BICHROMATE OF POTASSIUM.

(Bichromate of Potassium, $K_2Cr_2O_7$=295.)

Take of Bichromate of Potassium, 147·5 grs.; Distilled Water, a sufficiency: put the Bichromate of Potassium into the 10,000-grain flask, and, having half filled the flask with Water, allow the salt to dissolve; then dilute the solution with more Water, until it has the exact bulk of 10,000 grain-measures. 1000 grain-measures of this solution contain $\frac{1}{20}$th of an equivalent in grains (=14·75 grains) of Bichromate of Potassium, and when added to a solution of a Ferrous salt acidulated with Hydrochloric Acid, are capable of converting $\frac{1}{20}$th of six equivalents of Iron (=16·8 grains) from the Ferrous to the Ferric state.

Grammes and cubic centimetres may be employed instead of grains and grain-measures, but for convenience $\frac{1}{10}$th of the numbers should be taken. Thus 14·75 grammes of Bichromate of Potassium should be made to form 1000 cubic centimetres of solution. 100 cubic centimetres of this solution contain $\frac{1}{200}$th of an equivalent in grammes of the Bichromate of Potassium (=1·475 grammes), and are capable of converting $\frac{1}{200}$th of six equivalents of Iron (1·68 grammes) from the Ferrous to the Ferric state.

This solution is used for determining the proportion of Ferrous salt in the following preparations. It is known that the whole of the Ferrous salt has been converted into a Ferric salt when a minute drop of the liquid, placed in contact with a drop of a very dilute solution of Ferricyanide of Potassium on a white plate, ceases to strike with it a blue colour.

| | British Weights and Measures. | | | | Metrical Weights and Measures. | | |
|---|---|---|---|---|---|---|---|
| | Grains weight of Substance. | = | Grain-measures of Vol. Sol. | or | Grammes weight of Substance. | = | C. C. of Vol. Sol. |
| Ferri Arsenias . . . | 100 | = | 225 | or | 10·0 | = | 22·5 |
| ,, Carb. Sacch. . | 30 | = | 287·5 | or | 3·0 | = | 28·75 |
| ,, Phosphas . . . | 30 | = | 279 | or | 3·0 | = | 27·9 |
| ,, Sulphas . . . | 42·1 | = | 500 | or | 4·21 | = | 50·0 |
| ,, ,, Exsiccata | 10·0 | = | 191 | or | 1·0 | = | 19·1 |
| ,, ,, Granulata | 41·7 | = | 500 | or | 4·17 | = | 50·0 |

## VOLUMETRIC SOLUTION OF HYPOSULPHITE OF SODIUM.

(Hyposulphite of Sodium Crystallised, $Na_2S_2O_3, 5H_2O = 248$.)

Take of Hyposulphite of Sodium, in crystals, 280 grs.; Distilled Water, a sufficiency: dissolve the Hyposulphite of Sodium in 10,000 grain-measures of Water. Fill a burette with this solution, and drop it cautiously into 1000 grain-measures of the volumetric solution of Iodine, until the brown colour is just discharged. Note the number of grain-measures ($n$) required to produce this effect; then put 8000 grain-measures of the same solution into a graduated jar, and augment this quantity by the addition of Distilled Water, until it amounts to $\frac{8000 \times 1000}{n}$ grain-measures. If, for example, $n = 950$, the 8000 grain-measures of solution should be diluted to the bulk of $\frac{8000 \times 1000}{950} = 8421$ grain-measures. 1000 grain-measures of this solution contain $\frac{1}{10}$th of an equivalent in grains = 24·8 grains of the Hyposulphite, and therefore correspond to $\frac{1}{10}$th of an equivalent in grains = 12·7 grains of Iodine.

Grammes and cubic centimetres may be employed instead of grains and grain-measures, but for convenience $\frac{1}{10}$th of the numbers should be taken. 100 cubic centimetres of this solution contain $\frac{1}{100}$th of an equivalent of Hyposulphite in grammes (= 2·48 grammes), and therefore correspond to $\frac{1}{100}$th of an equivalent in grammes (1·27 grammes) of Iodine.

The solution is used for testing the following substances. In each case, excepting that of Iodine, a solution of Iodide of Potassium and Hydrochloric Acid is added to the substance, and the amount of Iodine so liberated is indicated by this solution.

| | British Weights and Measures. | | | | Metrical Weights and Measures. | | |
|---|---|---|---|---|---|---|---|
| | Grains weight of Substance. | = | Grain-measures of Vol. Sol. | or | Grammes weight of Substance. | = | C. C. of Vol. Sol. |
| Calx Chlorinata . . | 5·0 | = | 467 | or | 0·50 | = | 46·7 |
| Iodum . . . . . . | 12·7 | = | 1000 | or | 1·27 | = | 100·0 |
| Liq. Calc. Chlorinatæ | 80·0 | = | 450 | or | 8·00 | = | 45·0 |
| ,, Chlori . . . | 439·0 | = | 750 | or | 43·90 | = | 75·0 |
| ,, Sodæ Chlorinatæ | 70·0 | = | 500 | or | 7·00 | = | 50·0 |

## VOLUMETRIC SOLUTION OF IODINE.

(Iodine, I = 127.)

Take of Iodine, 127 grains; Iodide of Potassium, 180 grains; Distilled Water, a sufficiency: put the Iodide of Potassium and the Iodine into the 10,000-grain flask, fill the flask to about two-thirds its bulk with Distilled Water, gently agitate until solution is complete, and then dilute the solution with more Water until it has the exact volume of 10,000 grain-measures. 1000 grain-measures of this solution contain $\frac{1}{10}$th of an equivalent in grains (12·7 grains) of Iodine, and therefore correspond to 1·7 grains of Sulphuretted Hydrogen, 3·2 grains of Sulphurous, and 4·95 grains of Arsenious Anhydride.

Grammes and cubic centimetres may be employed instead of grains and grain-measures, but for convenience $\frac{1}{10}$th of the numbers should be taken. 100 cubic centimetres contain 1·27 grammes of Iodine, and correspond to 0·17 gramme of Sulphuretted Hydrogen, 0·32 gramme of Sulphurous Anhydride, and 0·495 gramme of Arsenious Anhydride.

This solution is used for testing the following substances. It is dropped from the burette into the liquid to be tested until free Iodine begins to appear in the solution.

| | British Weights and Measures. | | | | Metrical Weights and Measures. | | |
|---|---|---|---|---|---|---|---|
| | Grains weight of Substance. | = | Grain-measures of Vol. Sol. | or | Grammes weight of Substance. | = | C. C. of Vol. Sol. |
| Acid. Arseniosum . . | 4·0 | = | 808 | or | 0·40 | = | 80·8 |
| ,, Sulphurosum . . | 64·0 | = | 1000 | or | 6·40 | = | 100·0 |
| Liquor Arsenicalis . . | 442·0 | = | 875 | or | 44·20 | = | 87·5 |
| ,, Arsenici Hydrochloricus | 442·0 | = | 875 | or | 44·20 | = | 87·5 |
| Sodii Hyposulphis . . | 24·8 | = | 1000 | or | 2·48 | = | 100·0 |

## VOLUMETRIC SOLUTION OF NITRATE OF SILVER.

(Nitrate of Silver, $AgNO_3 = 170$.)

Take of Nitrate of Silver, 170 grs.; Distilled Water, a sufficiency: put the Nitrate of Silver into the 10,000-grain flask, and, having half filled the flask with Water, allow the salt to dissolve; then dilute the solution with more Water until it has the exact volume of 10,000 grain-measures. The solution should be kept in an opaque stoppered bottle. 1000 grain-measures of this solution contain $\frac{1}{10}$th of an equivalent in grains (17 grains) of Nitrate of Silver.

Grammes and cubic centimetres may be employed instead of grains and grain-measures, but for convenience $\frac{1}{10}$th of the numbers should be taken. 100 cubic centimetres contain $\frac{1}{100}$th of an equivalent in grammes (1·7 grammes) of Nitrate of Silver.

It is used in testing the following substances:—

| | British Weights and Measures. | | | | Metrical Weights and Measures. | | |
|---|---|---|---|---|---|---|---|
| | Grains weight of Substance. | = | Grain-measures of Vol. Sol. | or | Grammes weight of Substance. | = | C. C. of Vol. Sol. |
| Acid. Hydrocyan. Dil. | 270 | = | 1000 | or | 27·0 | = | 100·0 |
| Ammonii Bromidum . | 5 | = | 508·5 to 514·5 | or | 0·5 | = | 50·85 to 51·45 |
| Aqua Laurocerasi . | 810 | = | 150 | or | 81·0 | = | 15 |
| Potassii Bromidum . | 10 | = | 838 to 850 | or | 1·0 | = | 83·8 to 85·0 |
| ,, Cyanidum . . | 10 | = | 730 | or | 1·0 | = | 73·0 |
| ,, Iodidum . . | 10 | = | 602 | or | 1·0 | = | 60·2 |
| Sodii Bromidum . . | 10 | = | 960 | or | 1·0 | = | 96·0 |
| ,, Iodidum . . . | 10 | = | 660 | or | 1·0 | = | 66·0 |

## VOLUMETRIC SOLUTION OF OXALIC ACID.

(Crystallised Oxalic Acid, $H_2C_2O_4 . 2H_2O = 126$.)

Take of Oxalic Acid, in crystals, 660 grs.; Distilled Water, a sufficiency: put the Oxalic Acid into the 10,000-grain flask, fill the flask to about two-thirds of its bulk with Water, allow the Acid to dissolve, and then dilute the solution with more Water until it has the exact volume of 10,000 grain-measures. Fill a burette with the fluid, and add it gradually to a solution of 10·6 grains of pure Carbonate of Sodium (which may be obtained by heating the ordinary pure Bicarbonate of Sodium to redness in a platinum crucible for a quarter of an hour), containing a few drops of Solution of Litmus, until the red colour produced ceases to change to blue on boiling. Note the number of grain-measures used (*n*), then put 9000 grain-measures of the Solution of Oxalic Acid into a graduated jar, and augment this quantity by the addition of Distilled Water until it amounts to $\frac{9000 \times 200}{n}$ grain-measures. 1000 grain-measures of this solution contain half an equivalent in grains (=63 grains) of Oxalic Acid, and are therefore capable of neutralising one equivalent in grains of an alkali, such as Potash, KHO, or Soda, NaHO, or half an equivalent in grains of such salts as Anhydrous Carbonate of Sodium $Na_2CO_3$.

Grammes and cubic centimetres may be employed instead of grains and grain-measures, but for convenience $\frac{1}{10}$th of the numbers should be taken. 100 cubic centimetres contain $\frac{1}{20}$th of an equivalent in grammes (=6·3 grammes) of Oxalic Acid, and will neutralise $\frac{1}{10}$th of an equivalent in grammes of an alkali.

The following substances are tested with this solution:—

| | British Weights and Measures. | | | | Metrical Weights and Measures. | | |
|---|---|---|---|---|---|---|---|
| | Grains weight of Substance. | = | Grain-measures of Vol. Sol. | or | Grammes weight of Substance. | = | C. C. of Vol. Sol. |
| Ammonii Carbonas . . | 52·3 | = | 1000 | or | 5·23 | = | 100·0 |
| Borax . . . . . . . | 191·0 | = | 1000 | or | 19·10 | = | 100·0 |
| Liq. Ammoniæ . . . | 85·0 | = | 500 | or | 8·50 | = | 50·0 |
| ,, ,, Fort. . | 52·3 | = | 1000 | or | 5·23 | = | 100·0 |
| ,, Calcis . . . . | 4375·0 | = | 180 | or | 437·50 | = | 18·0 |
| ,, ,, Sacchar. . | 460·2 | = | 254 | or | 46·02 | = | 25·4 |
| ,, Plumbi Subacet. . | 284·5 | = | 500 | or | 28·45 | = | 50·0 |
| ,, Potassæ . . . . | 462·9 | = | 482 | or | 46·29 | = | 48·2 |
| ,, ,, Efferves. . | 4375·0 | = | 150 | or | 437·50 | = | 15·0 |
| ,, Sodæ . . . . . | 458·0 | = | 470 | or | 45·80 | = | 47·0 |
| ,, ,, Efferves. . | 4375·0 | = | 178 | or | 437·50 | = | 17·8 |
| Plumbi Acetas . . . | 38·0 | = | 200 | or | 3·80 | = | 20·0 |
| Potassa Caustica . . | 56·0 | = | 900 | or | 5·60 | = | 90·0 |
| Potassii Bicarbonas . . | 50·0 | = | 500 | or | 5·00 | = | 50·0 |
| ,, Carbonas . . | 83·0 | = | 980 | or | 8·30 | = | 98·0 |
| ,, Citras . . . | 102·0 | = | 1000 | or | 10·20 | = | 100·0 |
| ,, Tartras . . . | 122·0 | = | 990 | or | 12·20 | = | 99·0 |
| ,, ,, Acida . | 204·0 | = | 1000 | or | 20·40 | = | 100·0 |
| Soda Caustica . . . | 40·0 | = | 900 | or | 4·00 | = | 90·0 |
| ,, Tartarata . . . | 141·0 | = | 990 | or | 14·10 | = | 99·0 |
| Sodii Benzoas . . . | 10 | = | 69 to 70 | or | 1 | = | 6·9 to 7 |
| ,, Bicarbonas . . | 84·0 | = | 1000 | or | 8·40 | = | 100·0 |
| ,, Carbonas . . . | 143·0 | = | 960 | or | 14·30 | = | 96·0 |
| Sodium. . . . . . . | 23·0 | = | 975 | or | 2·30 | = | 97·5 |
| Spir. Ammon. Arom. . | 392·0 | = | 558 | or | 39·20 | = | 55·8 |

## VOLUMETRIC SOLUTION OF SODA.

(Hydrate of Sodium, NaHO=40.)

Take of Solution of Soda, a sufficiency; Distilled Water, a sufficiency: fill a burette with the Solution of Soda, and cautiously drop this into 1000 grain-measures of the volumetric Solution of Oxalic Acid, until the acid is exactly neutralised as indicated by Litmus. Note the number of grain-measures ($n$) of the Solution of Soda used, and, having then introduced 9000 grain-measures of it into a graduated jar, augment this quantity by the addition of Water, until it becomes $\frac{9000 \times 1000}{n}$ grain-measures, If, for example, $n=930$, the 9000 grain-measures should be augmented to $\frac{9000 \times 1000}{930} = 9677$ grain-measures. 1000 grain-measures of this solution contain one equivalent in grains (40 grains) of Hydrate of Sodium, and will therefore neutralise one equivalent in grains of any monobasic acid, or half the equivalent in grains of any dibasic acid, &c.

Grammes and cubic centimetres may be employed instead of grains and grain-measures, but for convenience $\frac{1}{10}$th of the numbers should be taken. 100 cubic centimetres contain $\frac{1}{10}$th equivalent in grammes (4 grammes) of Hydrate of Sodium, and will neutralise $\frac{1}{10}$th of an equivalent in grammes of a monobasic acid.

This solution is used for testing the following substances:—

| | British Weights and Measures. | | | | Metrical Weights and Measures. | | |
|---|---|---|---|---|---|---|---|
| | Grains weight of Substance. | = | Grain-measures of Vol. Sol. | or | Grammes weight of Substance. | = | C. C. of Vol. Sol. |
| Acetum . . . . . | 445·4 | = | 402 | or | 44·54 | = | 40·2 |
| Acid. Aceticum . . . | 182·0 | = | 1000 | or | 18·20 | = | 100·0 |
| ,, ,, Dil. . | 440·0 | = | 313 | or | 44·00 | = | 31·3 |
| ,, ,, Glac. . | 60·0 | = | 990 | or | 6·00 | = | 99·0 |
| ,, Citricum . . . | 70·0 | = | 1000 | or | 7·00 | = | 100·0 |
| ,, Hydrobrom. Dil. . | 810·0 | = | 1000 | or | 81·00 | = | 100·0 |
| ,, Hydrochloricum . | 114·8 | = | 1000 | or | 11·48 | = | 100·0 |
| ,, ,, Dil. | 345·0 | = | 1000 | or | 34·50 | = | 100·0 |
| ,, Lacticum . . . | 120·0 | = | 1000 | or | 12·00 | = | 100·0 |
| ,, ,, Dil. . . | 700·0 | = | 1000 | or | 70·00 | = | 100·0 |
| ,, Nitricum . . . | 90·0 | = | 1000 | or | 9·00 | = | 100·0 |
| ,, ,, Dil. . . | 361·3 | = | 1000 | or | 36·13 | = | 100·0 |
| ,, Nit. Hydrochl. Dil. | 352·0 | = | 883 | or | 35·20 | = | 88·3 |
| ,, Sulphuricum . . | 50·0 | = | 1000 | or | 5·00 | = | 100·0 |
| ,, ,, Arom. | 195·0 | = | 500 | or | 19·50 | = | 50·0 |
| ,, ,, Dil. . | 359·0 | = | 1000 | or | 35·90 | = | 100·0 |
| ,, Tartaricum . . . | 25·0 | = | 330 | or | 2·50 | = | 33·0 |
| Adeps Lanæ . . . . | 50 | = | 2 | or | 5 | = | 0·2 |

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# INDICATORS OF THE TERMINATION OF REACTIONS IN VOLUMETRIC OPERATIONS.

## MUCILAGE OF STARCH.

It gives an intense blue colour with Iodine. It may be used with the following substances:—

Acidum Arseniosum
,, Sulphurosum
Calx Chlorinata
Iodum
Liquor Arsenicalis

Liquor Arsenici Hydrochloricus
,, Calcis Chlorinatæ
,, Chlori
,, Sodæ Chlorinatæ
Sodii Hyposulphis

## SOLUTION OF FERRICYANIDE OF POTASSIUM.

It gives an intensely blue precipitate with Ferrous salts, but none with Ferric salts. It is used with the following substances:—

Ferri Arsenias
,, Carbonas Saccharata
,, Phosphas

Ferri Sulphas
,, ,, Exsiccata
,, ,, Granulata

### SOLUTION OF LITMUS.

It gives a red colour with acids and a blue colour with alkalies. It may be used with the following substances :—

Acidum Hydrochloricum
,, ,, Dilutum
,, Nitricum
,, ,, Dilutum
,, Nitro-Hydrochl. Dil.
,, Sulphuricum
,, Arom.
,, ,, Dil.
Ammonii Carbonas
Borax
Liquor Ammoniæ
,, ,, Fortior
,, Calcis
,, ,, Saccharatus
,, Potassæ
Liquor Potassæ Effervescens
,, Sodæ
,, ,, Effervescens
Potassa Caustica
Potassii Bicarbonas
,, Carbonas
,, Citras
,, Tartras
,, ,, Acida
Soda Caustica
,, Tartarata
Sodii Benzoas
,, Bicarbonas
,, Carbonas
Spiritus Ammoniæ Aromaticus

### SOLUTION OF YELLOW CHROMATE OF POTASSIUM.

It gives a red colour with Nitrate of Silver, but not in presence of a soluble Chloride, Bromide, or Iodide till sufficient Nitrate of Silver has been added to precipitate these as Silver salts; hence its use as an indicator in titration. It may be used with the following substances :—

Ammonii Bromidum
Potassii ,,
Potassii Iodidum
Sodii Bromidum
Sodii Iodidum.

### TINCTURE OF PHENOL-PHTHALEIN.

It gives an intense red colour with Potash or Soda. It may be used with the following substances :—

Acetum
Acidum Aceticum
,, ,, Dilutum
Acidum Aceticum Glaciale
,, Citricum
,, Tartaricum
Adeps Lanæ

# SPAS.

## IN BRITAIN.

*The solid contents of a pint are indicated by "grains in 20 fluid ounces."*

AIRTHREY (Bridge of Allan). Saline Aperient; 91 grs. in 20 oz. Chlorides of Sodium, Calcium, and Magnesium, and Sulphate of Calcium.

ALDFIELD (Yorkshire). A soft water; slightly Sulphureous.

ASKERNE (Yorkshire). A soft water; weak Saline Aperient and Sulphureous. Old Manor, 30 grs. in 20 oz., chiefly Magnesia and Lime.

ASHBY-DE-LA-ZOUCH. Salt Brine, used only for baths, when mixed with water.

BATH (Somersetshire). Altitude 16′. The only true thermal waters in England. Saline, 21 grs. in 20 oz., chiefly Sulphate of Lime, with Carbonic Acid and Nitrogen. Swimming Bath, 88°; Cross Bath, 104°; Kingston Spring, 108° (which partly supplies King's Bath); Queen's, 112°; King's, 117°; Hot Bath, 120°. Baths for chronic rheumatism, gout, and paralysis.

The water is aërated, and sold in bottles under the name of **Sulis Water.**

BOSCOMBE (Bournemouth, Hampshire). Chalybeate; contains 2¾ grs., which includes ½ gr. Iron in 20 oz., with Carbonic Acid.

BRIGHTON (Sussex). A cold Chalybeate; contains 11½ grs., which includes 1 gr. Iron in 20 oz., with Carbonic Acid.

BUTTERBY (Durham). Sulphureous. Not important.

BUXTON (Derbyshire). Altitude 900′. Bracing air; pure water, temp. 82° F.; contains only 2¼ grs. in 20 oz., with ½ cubic inch of Carbonic Acid, and 60 cubic inches of Nitrogen. Good in chronic gout and rheumatism.

CHELTENHAM (Gloucestershire). Of the *Montpelier Spas*, No. 1 is Saline Aperient; No. 2, Ioduretted and Sulphuretted Chalybeate; 4, pure Saline; 4*a*, strongly Ioduretted Saline; 5, Ioduretted Magnesian Saline. Of the *Royal Old Wells*, one is Chalybeate, and the rest Saline Aperient; the whole with more or less Carbonic Acid. Season, from July to October.

CLIFTON (Gloucestershire). Air mild, elastic. Hot Well, 74° F. Feebly Saline; contains 5½ grs. in 20 oz. A resort for pulmonary patients.

CROFT (Yorkshire). Water 51° F. Saline, strongly Sulphureous; contains 19½ grs. in 20 oz.; chiefly Sulphate of Magnesia. Useful in skin diseases.

DINSDALE (Northamptonshire). Water 52° F. Strongly Sulphureous; contains 27 grs. in 20 oz., chiefly Sulphate of Lime. Acting on the skin and kidneys, and useful in dyspepsia.

DORTON (Buckinghamshire). Chalybeate, with Carbonic Acid; contains 12 grs. of Sulphate of Iron in 20 oz.; needs much dilution for internal use.

DROITWICH (Worcestershire). Brine pits; when diluted, used for salt-baths only.

DUNBLANE (Perthshire). Saline; contains 46 grs. in 20 oz., chiefly Chlorides of Calcium and Sodium.

FILEY (Yorkshire). Saline aperient; contains 49 grs. in 20 oz., chiefly Chlorides of Sodium, Magnesium, and Calcium, and Sulphate of Magnesia.

FLITWICK (Ampthill, Beds). Chalybeate Aperient; contains 31 grs. in 20 oz., Carbonate of Iron, Sulphates of Magnesia and Soda, Chloride of Magnesium, and Carbonate of Lime.

GAINSBOROUGH (Lincolnshire). Weak Saline, Chalybeate; not important.

GILSLAND (Cumberland). Air bracing and very healthy. Two springs; one strongly Chalybeate, and one strongly Sulphureous, useful in skin diseases and dyspepsia.

GLOUCESTER SPA. Contains 70 grains in 20 oz., chiefly Chloride of Sodium and Sulphate of Soda; not important.

HAIL-WESTON (St. Neots, Hunts). Saline Aperient; contains 30 grs. in 20 oz., more than half of which is Chloride of Sodium; also Sulphates of Magnesia and Soda, and Carbonate of Lime.

HARROGATE (Yorkshire). The old Sulphur spring contains 137 grs. in 20 oz., chiefly Chlorides, with 3·12 cubic inches of Carbonic Acid Gas, and 1·4 Sulphuretted and Carburetted Hydrogen. There are two principal Chalybeate springs. The new spring contains 62 grs. in 20 oz., chiefly Chlorides of Calcium, Magnesium, Potassium, and Sodium, with Protochloride of Iron, together with Carbonic Acid and Nitrogen.

HASTINGS (Sussex). Air mild, Chalybeate ; contains 2¾ grs. in 20 oz., chiefly Sulphates of Iron, Magnesia, Lime, and Soda, with 3¼ cubic inches Carbonic Acid Gas.

HOCKLEY (near Southend, Essex). Saline, and very mild Aperient.

HORLEY GREEN (Yorkshire). Aluminous, and strongly Chalybeate; contains large quantities of Sulphate of Iron. Not much used.

HOVINGDON (Northumberland). Feebly Alkaline and Sulphureous; 6 grs. in 20 oz., chiefly Carbonate of Soda and Chloride of Sodium.

INVERLEITHEN (Peeblesshire). Air pure, and scenery good. Saline; 28 grs. in 20 oz., chiefly Chlorides of Calcium and Sodium.

KINGSWOOD (Gloucestershire). Cherry rock bitter water; 56 grs. in 20 oz., chiefly Sulphates of Magnesia and Soda, with 4 cubic inches of Carbonic Acid.

LEAMINGTON (Warwickshire). Old Well, 48° F., contains 104 grs. in 20 oz., chiefly Chlorides of Calcium and Sodium, and Sulphate of Soda with Carbonic Acid. The Saline Chalybeate contains 132 grs. in 20 oz., chiefly Chlorides of Calcium, Magnesium, and Sodium, and Sulphate of Soda, with 2 cubic inches of Carbonic Acid. There are also other springs, useful in stomach and liver complaints.

LONDON, Bagnigge Wells, 1 Aperient, 1 Chalybeate; Chad's Well, near Battle Bridge, and St. Pancras Wells, both Aperient; Hampstead, Sadler's Wells, and Kensington Gardens, Chalybeate: Beulah, Kilburn, Epsom, and Streatham, are all Aperient; chiefly Sulphate of Magnesia.

MALTON (Yorkshire). A strong Saline Chalybeate, similar to Scarborough.

MALVERN (Worcestershire). Air mild, highly salubrious. Holywell, St. Anne, cold and pure, highly useful in painful affections of the kidneys and bladder.

MATLOCK (Derbyshire). Climate mild and humid. Calcareous, slightly Chalybeate, with Carbonic Acid.

MELKSHAM (Wiltshire). Two springs, one Saline, and one Chalybeate. These waters are charged with Carbonic Acid artificially, and bottled.

MOFFAT (Dumfriesshire). Hartfell spring, Aluminous and strongly Chalybeate; 12 grs. in 20 oz. A resort for pulmonary patients. Sulphur Wells, contains 4½ grs. in 20 oz., chiefly Chloride of Sodium, and 1 cubic inch of Sulphuretted Hydrogen.

PITCAITHLY (Perthshire). Saline; contains 38 grs. in 20 oz., chiefly Chloride of Calcium and Chloride of Sodium, and 1 cubic inch of Carbonic Acid.

PURTON (Wiltshire). Iodide of Sodium and Bromide of Magnesium, with Sulphates of Magnesia and Soda: 43½ grs. in 20 oz., and 6 cubic inches of Carbonic Acid Gas.

SANDROCK (I. of Wight). Aluminous Chalybeate, with Carbonic Acid; contains 41½ grs. of Sulphate of Iron, and 31½ grs. of Sulphate of Alumina in 20 oz. Used for baths, but much diluted when taken internally.

SCARBOROUGH (Yorkshire). Altitude 174′. Two Saline Chalybeates. North Well 45¼ grs. in 20 oz. South Well, 66 grs. in 20 oz. Both Wells are similarly constituted, containing Sulphate of Lime and Sulphate of Magnesia, with a small amount of Nitrogen Gas.

SHAP (Westmoreland). Saline; contains 48 grs. to 20 oz., of which 26 are Chloride of Calcium; also traces of Sulphuretted Hydrogen. Tonic and diuretic; good in scrofula.

SHOTLEY (Northumberland). Saline, Chalybeate; contains 20 grs. in 20 oz., chiefly Chloride of Sodium, with 1 gr. Oxide of Iron, and $4\frac{1}{2}$ grs. Chloride of Calcium. Not much frequented.

STRATHPEFFER (Ross-shire). Two springs; the Upper contains 18 grs. in 20 oz., chiefly Sulphates of Soda and Lime, with $3\frac{1}{4}$ cubic inches of Sulphuretted Hydrogen; the Lower contains $13\frac{1}{2}$ grs. in 20 oz. of the same salts, but with only $1\frac{2}{3}$ c. in. of Sulphuretted Hydrogen. The Upper contains the largest quantity of Sulphuretted Hydrogen of any spring in Britain. Much resorted to for gout, rheumatism, scrofula, and skin diseases.

TUNBRIDGE (Kent). Altitude 289′. Chalybeate; temp. 50° F.; contains only 1 gr. in 20 oz., including $\frac{1}{8}$th of a grain of Iron, with Carbonic Acid.

TYNEMOUTH (Northumberland). Scenery picturesque. Chalybeates which may be drunk as an auxiliary to the sea-bathing, as at Scarborough.

VICTORIA (Stratford, Essex). Saline Aperient; contains 81 grs. in 20 oz., chiefly Sulphate of Soda, and $\frac{1}{2}$ cubic inch of Sulphuretted Hydrogen. Useful in stomach and liver diseases.

WHITBY (Yorkshire). Bagdale, Chalybeate; nearly 3 grs. in 20 oz., and $\frac{1}{5}$th gr. of Carbonate of Iron.

WINFRED at Holywell (Flintshire). Pure water, and flows at the rate of 21 tons a minute

WOODHALL (Lincolnshire). 55° F. Iodine and Bromine, with Chlorides of Calcium, Magnesium, Potassium, more than $\frac{1}{2}$ gr. Bromide of Sodium, and $\frac{1}{14}$ gr. Iodide of Sodium: 190 grs. in 20 oz.; strongly impregnated with Carbonic Acid. Useful in chronic rheumatism, scrofula, tertiary syphilis, etc.

## FOREIGN.

The statements, regarding the utility of the several Waters in various complaints, are taken from circulars obtained from the Spas.

*The dose is from a wineglassful to a tumblerful, and at the Spas the gas is often allowed to escape.*

ACHSELMANNSTEIN (Bavaria), altitude 1407′. Saline, aperient, and slightly chalybeate. Climate mild and equable. Season, May to September.

Baths and Vapour Baths, for incipient tuberculosis, cutaneous diseases, and derangements of the uterine system.

*Buchner's Analysis* of 16 oz. Troy=7680 grs. of the Edelquelle brine spring:—

| | | | |
|---|---|---|---|
| | | | 1757·69 |
| Chloride of Sodium | 1723·10 | Sulphate of Lime | 31·98 |
| Chloride of Ammonium | ·19 | Carbonate of Lime | ·07 |
| Chloride of Magnesium | 13·84 | Carbonate of Magnesia | traces |
| Bromide of Magnesium | ·23 | Peroxide of Iron and Alumina | ·06 |
| Sulphate of Soda | 15·63 | Silica | ·08 |
| Sulphate of Potash | 4·70 | | |
| | 1757·69 | | 1789·88 grs. |

*Gas.*—Carbonic Acid.

ADELHEIDSQUELLE (Heilbrunn, a healthy town in Bavaria), altitude 2000′. Saline, with Iodine and Bromine. Temp. of spring, 50° F. Season, May to September.

Powerfully alterative and tonic. Useful in scrofulous complaints, strumous affections of the skin, rheumatism, and gout, and for complaints peculiar to females.

*Pettenkofer's Analysis* of 16 oz. Troy=7680 grs.—Contains about 47 grs. of solid matter, viz.:—

| | | | |
|---|---|---|---|
| Chloride of Sodium | 38·06 | | 45·48 |
| Iodide of Sodium | ·21 | Carbonate of Magnesia | ·14 |
| Bromide of Sodium | ·36 | Alumina | ·14 |
| Carbonate of Soda | 6·21 | Carbonate of Iron | ·07 |
| Chloride of Potassium | ·02 | Silica | ·14 |
| Sulphate of Soda | ·04 | Phosphate of Lime | traces |
| Carbonate of Lime | ·58 | Organic matter | ·16 |
| | 45·48 | | 46·13 grs. |

| *Gases.* | | Cub. Inch. |
|---|---|---|
| | Carbonic Acid | 13·18 |
| | Carburetted Hydrogen | 8·02 |
| | Nitrogen | 6·54 |
| | Oxygen | 1·38 |
| | | 29·12 |

Imported.

AIX-LA-CHAPELLE (Rhenish Prussia), altitude 450′. Situated in a valley. Climate mild. Mean temperature in June, July, and August, 63° F. Saline, sulphureous.

Used for drinking, bathing, and douching; in cutaneous diseases, stiffness of joints, paralysis, obstructions of the liver, and syphilis.

*Liebig's Analysis* of 16 oz. Troy = 7680 grs.:—

| | Kaiser-quelle. | Cornelius-quelle. | Rosen-quelle. | Quirinus-quelle. | |
|---|---|---|---|---|---|
| Temperature, Fahr. | 131° | 121·3°. | 116·6°. | 113·6°. | |
| Chloride of Sodium | 20·271 | 18·934 | 19·552 | 19·937 | grains. |
| Bromide of Sodium | ·028 | ·028 | ·028 | ·028 | „ |
| Iodide of Sodium | ·004 | ·004 | ·004 | ·004 | „ |
| Sulphuret of Sodium | ·073 | ·042 | ·057 | ·018 | „ |
| Carbonate of Soda | 4·995 | 3·817 | 4·065 | 4·244 | „ |
| Sulphate of Soda | 2·171 | 2·201 | 2·176 | 2·243 | „ |
| Sulphate of Potash | 1·186 | 1·204 | 1·183 | 1·164 | „ |
| Carbonate of Lime | 1·217 | 1·012 | 1·413 | 1·330 | „ |
| Carbonate of Magnesia | ·395 | ·192 | ·204 | ·257 | „ |
| Carbonate of Strontia | ·002 | ·002 | ·002 | ·002 | „ |
| Carbonate of Lithia | ·002 | ·002 | ·002 | ·002 | „ |
| Carbonate of Protoxide of Iron | ·073 | ·046 | ·046 | ·040 | „ |
| Silica | ·508 | ·459 | ·455 | ·476 | „ |
| Organic Matter | ·577 | ·713 | ·703 | ·751 | „ |
| | 31·502 | 28·654 | 29·888 | 30·496 | grains. |
| *Gases.* | | | | | |
| Nitrogen | 9·00 | 7·79 | 9·14 | 6·41 | per cent. |
| Carbonic Acid | 89·40 | 92·91 | 90·31 | 93·25 | „ |
| Carburetted Hydrogen | ·37 | traces | ·55 | ·26 | „ |
| Oxygen | 1·23 | traces | 0·00 | ·08 | „ |

Imported.

AIX-LES-BAINS (Savoy), altitude 768′. Climate mild. For drinking and for douching.

Recommended for rheumatism, eczema, gout, and sciatica.

*Bonjean's Analysis* of 16 oz. Troy=7680 grs.:—

| | Sulphur Spring. | Alum Spring. | |
|---|---|---|---|
| Temperature, Fahr. | 108·25°—111°. | 108·25°—116·34°. | |
| Sulphate of Soda | ·7374 | ·3256 | grains. |
| Sulphate of Magnesia | ·2709 | ·2380 | „ |
| Sulphate of Lime | ·1229 | ·1152 | „ |
| | 1·1312 | ·6788 | (*continued*) |

| | Sulphur Spring. | Alum Spring. | |
|---|---|---|---|
| (*Continued.*) | 1·1312 | ·6788 | grains. |
| Sulphate of Alumina | ·4209 | ·4761 | ,, |
| Sulphate of Iron | traces | traces | ,, |
| Chloride of Sodium | ·0613 | ·1075 | ,, |
| Chloride of Magnesium | ·1322 | ·1690 | ,, |
| Fluoride of Calcium<br>Phosphate of Lime and Alumina | ·0191 | ·0200 | ,, |
| Iodide of Potassium | traces | traces | ,, |
| Carbonate of Lime | 1·1405 | 1·3901 | ,, |
| Carbonate of Strontia | traces | traces | ,, |
| Carbonate of Protoxide of Iron | ·0680 | ·0719 | ,, |
| Silica | ·0384 | ·0330 | ,, |
| | 3·0116 | 2·9464 | grains. |
| *Gases.* | | | |
| Nitrogen | ·03204 | ·08010 | volumes. |
| Carbonic Acid | ·02578 | ·01334 | ,, |
| Sulphuretted Hydrogen | ·04140 | ·0 | ,, |
| Oxygen | ·0 | ·01840 | ,, |
| | ·09922 | ·11184 | volumes. |

ALET (Aude, France). Thermal 82° F. for baths and a ferruginous water 50°. Tonic, and useful in cases of debility and dyspepsia.

ALEXANDERBAD (Bavaria). Altitude 1754′. Climate rough, and unsuited for delicate lungs. Scenery good. Water chalybeate, 50° F., very exciting. There is a hydropathic establishment, and pine-foliage baths for rheumatism.

Contains 2¼ grains of solid constituents in 16 oz. Troy = 7680 grs.
about ¼ grain Carbonate of Iron,
and 28 cubic inches of Carbonic Acid.

ALEXISBAD (Germany, 2 miles W. of Harzgerode). In the romantic Selke valley.

Source, Selkenbrunnen, Saline ; 1⅓ grain in 16 oz. troy.
,, Alexisbrunnen, Ferruginous ; 3½ grains in 16 oz. troy.
,, Ernabrunnen, Ferruginous ; 1⅓ grain in 16 oz. troy.

ALLEVARD (Isère, France). Altitude 1473′. A gaseous iodo-sulphuretted water.

*Dupasquieu's Analysis* of 16 oz. :—

| | | |
|---|---|---|
| Carbonate of Lime | 2·135 | grains. |
| Carbonate of Magnesia | ·070 | ,, |
| Chloride of Sodium | 3·521 | ,, |
| Chloride of Magnesium | ·427 | ,, |
| Sulphate of Lime | 2·086 | ,, |
| Sulphate of Magnesia | 3·661 | ,, |
| Sulphate of Soda | 3·675 | ,, |
| Silicic Acid | ·035 | ,, |
| Iodine | ·042 | ,, |
| | 156·52 | ,, |
| *Gases.* | | |
| Sulphuretted Hydrogen (free) | 173·25 | grains. |
| Carbonic Acid Gas (free) | 679·00 | ,, |
| Nitrogen | 287·00 | ,, |
| | 1139·25 | ,, |

ALTWASSER (Prussian Silesia, 35 miles S.W. of Breslau). Altitude 1255′. Lies in a charming valley. Climate mild and bracing. Water alkaline, chalybeate, tonic, restorative, for drinking and for baths.

*Fischer's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Georgen-brunnen. | Ober-brunnen. | |
|---|---|---|---|
| Temperature, Fahr. | 70°. | 70°. | |
| Carbonate of Iron | ·37 | ·306 | grains. |
| Carbonate of Manganese | 0 | ·13 | ,, |
| Chloride of Potassium | ·09 | ·09 | ,, |
| Sulphate of Potash | 0 | ·086 | ,, |
| Sulphate of Soda | ·89 | ·40 | ,, |
| Sulphate of Magnesia | 0 | ·25 | ,, |
| Carbonate of Magnesia | ·72 | ·308 | ,, |
| Carbonate of Lime | 2·88 | ·860 | ,, |
| Sulphate of Lime | 0 | ·100 | ,, |
| Carbonate of Soda | 1·21 | ·000 | ,, |
| Silica | ·08 | ·52 | ,, |
| | 6·54 | 3·18 | grains. |
| Carbonic Acid | 106 in 100 | 50 in 100 | volumes. |

APOLLINARIS (Neuenahr). Imported and drunk at meals. (*See* Neuenahr.)

ARNSTADT (Germany, 10 miles W. of Erfurt). Altitude 926′. Climate healthy. Season, June to September. Its brine spring, when diluted, used for baths, and for poultices with bran or malt; for scrofula. Contains about 1825 grains of solids in 16 oz. Troy = 7680 grs. viz.:—

| | | |
|---|---|---|
| Chloride of Sodium | 1723·0 | grains. |
| Chloride of Calcium | 49·5 | ,, |
| Chloride of Magnesium | 39·0 | ,, |
| Sulphate of Lime | 13·0 | ,, |
| Bromide of Magnesium | 0·39 | ,, |

AUTEUIL (Seine, France). A ferruginous water having properties similar to that of Alet.

BADEN (near Vienna). Altitude 638′. Air bracing, temperature changeable. Sulphureous and saline.

Chiefly used for bathing, in which both sexes promenade. The mineralised mud is employed for cataplasms in rheumatism.

*Keller's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Römer-quelle. | Leopold's-quelle. | |
|---|---|---|---|
| Temperature, | 92°—97° Fahr. | 91·70°. | |
| Sulphuret of Magnesium | 0·1250 | ·1180 | grains. |
| Sulphate of Lime | 5·6563 | 5·5473 | ,, |
| Sulphate of Potash | ·4892 | ·5560 | ,, |
| Sulphate of Soda | 2·1281 | 2·5766 | ,, |
| Chloride of Sodium | 1·9906 | 2·2659 | ,, |
| Carbonate of Lime | 1·3056 | 1·5936 | ,, |
| Carbonate of Soda | ·5329 | ·0530 | ,, |
| Chloride of Magnesium | 1·6156 | 1·5145 | ,, |
| Silica | ·1850 | ·2166 | ,, |
| Organic Matter | ·0431 | 0 | ,, |
| | 14·0714 | 14·4415 | grains. |
| *Gases.* | | | |
| Carbonic Acid | 1·433 | 3·2256 | cubic inches. |
| Sulphuretted Hydrogen | ·082 | ·6720 | ,, |
| Nitrogen | ·465 | 7·8711 | ,, |
| Oxygen | ·052 | ·9033 | ,, |
| | 2·032 | 12·6780 | cubic inches. |

BADEN-BADEN. Altitude 616′. Air pure and mild. Mean annual temperature 48° F. Season, May to October.

Baths for rheumatism and paralysis.

*Bunsen's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Hauptquelle. Temperature 155·7° F. | |
|---|---|---|
| Chloride of Sodium | 16·520 | grains. |
| Bicarbonate of Lime | 1·273 | ,, |
| Bicarbonate of Magnesia | ·042 | ,, |
| Bicarbonate of Protoxide of Iron | ·037 | ,, |
| Bicarbonate of Protoxide of Manganese | traces | ,, |
| Bicarbonate of Ammonia | ·051 | ,, |
| Sulphate of Lime | 1·556 | ,, |
| Sulphate of Potash | ·017 | ,, |
| Phosphate of Lime | ·021 | ,, |
| Arseniate of Iron | traces | ,, |
| Chloride of Magnesium | ·097 | ,, |
| Chloride of Potassium | 1·258 | ,, |
| Bromide of Sodium | traces | ,, |
| Silica | ·914 | ,, |
| Alumina | ·008 | ,, |
| Nitrates | traces | ,, |
| | 22·093 | grains. |
| Free Carbonic Acid | ·299 | grains. |

The Lithia waters for gout and lithiasis :—

| | Mur-quelle. | Fett-quelle. | |
|---|---|---|---|
| Chloride of Sodium | 15·5534 | 16·9767 | grains. |
| Chloride of Lithium | 2·3694 | ·2315 | ,, |
| Chloride of Potassium | 1·7985 | ·8137 | ,, |
| Chloride of Magnesium | ·8022 | ·4406 | ,, |
| Chloride of Calcium | ·5127 | | ,, |
| Chloride of Copper | | trace | ,, |
| Bicarbonate of Lime | ·9748 | 1·4760 | ,, |
| Bicarbonate of Magnesia | ·2673 | ·0112 | ,, |
| Bicarbonate of Protoxide of Iron | ·0029 | ·0112 | ,, |
| Bicarbonate of Protoxide of Manganese | trace | trace | ,, |
| Sulphate of Lime | 1·8524 | 1·3390 | ,, |
| Sulphate of Potash | | ·3344 | ,, |
| Sulphate of Strontia | ·0052 | | ,, |
| Sulphate of Baryta | | trace | ,, |
| Ammonia | trace | trace | ,, |
| Arseniate of Iron | trace | ·0038 | ,, |
| Silica | ·3200 | ·4477 | ,, |
| | 24·4588 | 22·0858 | grains. |

BAGNÈRES-DE-LUCHON (South of France). Altitude 2000′. Season, May to October.

Contains in 20 oz. about 2 grains of Sulphurets of Iron, Manganese, Sodium. The springs range in temperature from 60° F. to 154° F.; water is clear; has a sulphureous odour; is good in lymphatic and cutaneous affections.

BARÉGES (Hautes-Pyrénées, France). Altitude 4000′. There are nine sulphureous springs. Temperature 86° to 111° F. Season, May to September. Useful in inveterate chronic rheumatism and skin diseases.

*Analysis* of 16 oz. Troy = 7680 grs. Le Tambour Source :—

| | | |
|---|---|---|
| Sulphuret of Sodium | ·360 | grains. |
| Sulphate of Soda | ·384 | ,, |
| Chloride of Sodium | ·307 | ,, |
| Silica | ·519 | ,, |
| Lime | ·022 | ,, |
| Magnesia | ·026 | ,, |
| Soda | ·039 | ,, |
| *Gas.* | 1·657 | grains. |
| Nitrogen | ·004 | cubic ins. |

Imported.

BELLTHAL (Rhenish Prussia, near Coblentz). Altitude 400′. Drunk as a table water.

*Contents* in 10,000 parts:—

| | |
|---|---|
| Carbonate of Soda | 2·7918 |
| Carbonate of Potash | ·6898 |
| Silicate of Soda | ·6974 |
| Carbonate of Magnesia | 2·5676 |
| Carbonate of Lime | 5·9773 |
| Chloride of Sodium | ·2738 |
| Sulphate of Soda | ·1243 |
| Nitrate of Soda | ·0745 |
| Carbonate of Iron | ·0198 |
| Carbonate of Ammonia | ·0076 |
| Carbonate of Manganese | ·0047 |
| Phosphate of Lime | ·0015 |
| Alumina | ·0026 |
| Free Carbonic Acid | 36·410 parts by volume. |

Imported.

BERKA (Duchy of Saxe-Weimar).

The sulphureous spring contains 13½ grains of solids in 16 oz. Troy=7680 grs. For chronic rheumatism, anæmia, and great debility.

| | | |
|---|---|---|
| Sulphate of Lime | 5·5 | grains. |
| Carbonate of Lime | 4·33 | ,, |
| Sulphate of Soda | 1 | ,, |
| Sulphate of Magnesia | 2 | ,, |
| Chloride of Calcium | 0·7 | ,, |
| *Gases.* | | |
| Carbonic Acid | 3·4 | c. inches. |
| Sulphuretted Hydrogen with Nitrogen | 6·4 | ,, |

The chalybeate spring contains about 22 grains of solids in 16 oz. viz.:—

| | | |
|---|---|---|
| Sulphate of Lime | 13·5 | grains. |
| Carbonate of Lime | 3·5 | ,, |
| Chloride of Calcium | 0·5 | ,, |
| Chloride of Magnesium | 0·5 | ,, |
| Carbonate of Magnesium | 0·4 | ,, |
| Sulphate of Magnesia | 3·0 | ,, |
| Carbonate of Iron | 0·3 | ,, |

BETHESDA (Wisconsin, U.S.A.). Used in the treatment of diseases of the kidneys.

*Chandler's Analysis* of 16 oz.:—

| | | |
|---|---|---|
| Chloride of Sodium | ·1392 | grains. |
| Sulphate of Potassa | ·0546 | ,, |
| Sulphate of Soda | ·0542 | ,, |
| Bicarbonate of Lime | 2·0426 | ,, |
| Bicarbonate of Magnesia | 1·4865 | ,, |
| Bicarbonate of Protoxide of Iron | ·0050 | ,, |
| Bicarbonate of Soda | ·1507 | ,, |
| Phosphate of Soda | | |
| Alumina | ·0146 | ,, |
| Silica | ·0889 | ,, |
| Organic Matter | ·2379 | ,, |
| | 4·2745 | ,, |

BILIN (Bohemia). Altitude 645′.

Taken for indigestion and acidity of the stomach, and drunk as a table water.

*Analysis* of 16 oz. Troy = 7680 grs.:—

| | | |
|---|---|---|
| Carbonate of Soda | 23·106 | grains. |
| Carbonate of Lime | 3·089 | ,, |
| Carbonate of Magnesia | 1·098 | ,, |
| Carbonate of Lithia | ·110 | ,, |
| Carbonate of Iron | ·080 | ,, |
| Sulphate of Soda | 6·350 | ,, |
| Sulphate of Potash | ·985 | ,, |
| Chloride of Sodium | 2·935 | ,, |
| Phosphate of Alumina | ·065 | ,, |
| Silica | ·244 | ,, |
| | 38·062 | ,, |
| Free Carbonic Acid | 15·092 | cubic inches. |
| Carbonic Acid (as bicarbonate) | 17·247 | ,, ,, |

Imported.

BIRMENSTORF (Switzerland). Altitude 1300′. A mild laxative. Dose, ½ to ¾ of a tumblerful half an hour before breakfast. Temp. 50° F.

*Analysis* of 1,000 parts according to Bolley:—

| | |
|---|---|
| Sulphate of Potash | ·1042 |
| Sulphate of Soda | 7·0356 |
| Sulphate of Lime | 1·2692 |
| Sulphate of Magnesia | 22·0135 |
| Chloride of Magnesium | ·4604 |
| Carbonate of Lime | ·0133 |
| Carbonate of Magnesia | ·0324 |
| Magnesia (crenate of) | ·1010 |
| Peroxide of Iron | 1·0107 |
| Alumina | ·0277 |
| Silica | ·0302 |
| | 31·0982 |

Imported.

BIRRESBORN (Rhenish Prussia). Altitude 1100′. A table water, drunk *ad lib.*

*Analysis* of 1000 parts:—

| | |
|---|---|
| Bicarbonate of Soda | 2·81681 |
| Bicarbonate of Lithia | ·003346 |
| Bicarbonate of Lime | ·272988 |
| Bicarbonate of Baryta<br>Bicarbonate of Strontia | ·000154 |
| Bicarbonate of Magnesia | 1·092873 |
| Bicarbonate of Protoxide of Iron | ·035116 |
| Bicarbonate of Manganese | ·000668 |
| Biborate of Soda | traces. |
| Sulphate of Potash | ·052091 |
| Sulphate of Soda | ·135926 |
| Chloride of Sodium | ·357620 |
| Bromide of Sodium | ·000363 |
| Iodide of Sodium | ·000005 |
| Phosphate of Soda | ·000228 |
| Nitrate of Soda | traces. |
| Phosphate of Alumina | traces. |
| Silicic Acid | ·024532 |
| | 4·827591 |
| Free Carbonic Acid | 2·333967 |
| | 7·161558 |

BOCKLET (near Kissingen). Altitude 620′. Pleasant residence. Tonic, useful in diseases peculiar to females. Carbonic Acid Baths.

Temperature 50° F.

*Analysis* of 16 oz. Troy=7680 grs. :—

| | Ludwig's-quelle. (Ludwig's Spring.) | Schwefel-quelle. (Sulphur Spring.) | Stahl quelle. (Steel Spring.) | |
|---|---|---|---|---|
| Sulphate of Soda | 6·25 | ·25 | 2·54 | grs. |
| Sulphate of Magnesia | 0 | 0 | 3·23 | ,, |
| Sulphate of Lime | ·50 | 0 | 0 | ,, |
| Chloride of Sodium | 27·50 | ·25 | 6·55 | ,, |
| Chloride of Magnesium | 0·75 | 0 | 4·43 | ,, |
| Carbonate of Soda | 0 | ·50 | 0 | ,, |
| Carbonate of Magnesia | 1·25 | ·50 | 3·36 | ,, |
| Carbonate of Lime | 7·25 | 2·50 | 6·54 | ,, |
| Carbonate of Iron | ·65 | ·40 | ·61 | ,, |
| Silica | ·50 | ·10 | ·22 | ,, |
| | 44·65 | 4·90 | 27·48 | ,, |
| *Gases.* | | | | |
| Carbonic Acid | 31 | 21·5 | 39·3 | |
| Sulphuretted Hydrogen | 0 | 0·2 | 0 | |

BONIFACIUS (Hesse-Nassau). Altitude 825′. Stimulates the intestines and urinary organs.

*Analysis* of 16 oz. :—

| | | |
|---|---|---|
| Chloride of Sodium | 71·6912 | grains. |
| Chloride of Magnesium | 6·9076 | ,, |
| Chloride of Lithium | 1·5274 | ,, |
| Sulphate of Soda | ·9919 | ,, |
| Sulphate of Potash | 1·1214 | ,, |
| Sulphate of Lime | 10·9179 | ,, |
| Bicarbonate of Lime | 4·6431 | ,, |
| Bicarbonate of Magnesia | ·0581 | ,, |
| Bicarbonate of Oxide of Iron | ·0672 | ,, |
| Iodide of Magnesium | ·0343 | ,, |
| Bromide of Magnesium | ·0329 | ,, |
| Silicic Acid | ·0798 | ,, |
| Total Solid Constituents | 98·0728 | ,, |
| Carbonic Acid Gas (free) | 5·8102 | ,, |

Temperature, 10·6 Centigrade (51° Fahr.) .

BONNES (Basses-Pyrénées, France). Altitude 2000′. Air cold and penetrating. A sulphureous and saline water, less exciting than Baréges. Imported. Contains in 16 oz. Troy=7680 grs., 5⅓ grains of solids.

BONNES (Basses-Pyrénées).

Increases the natural secretion of the skin and kidneys. Dose, ¼ to ½ a tumbler taken before breakfast with two or three spoonfuls of boiling milk.

*Analysis* of 1 gallon=70,000 grs. :—

| | |
|---|---|
| Chloride of Potassium | 2·40 |
| Chloride of Sodium | 17·59 |
| Sulphate of Sodium | 2·86 |
| Silicate of Sodium | 5·28 |
| Sulphate of Calcium | 11·14 |
| Silica | 1·02 |
| Magnesium, Lithium, Nitrates, and Phosphates | traces. |
| Sulphuretted Hydrogen | 1½ cubic inches. |

BORCETTE or BURTSCHEID (near Aix-la-Chapelle).

There are two kinds of springs,—the warmer one, Mühlenbadquelle, 171° F., is free from Sulphuretted Hydrogen; the cooler, from 110° to 140° F., contains Sulphuretted Hydrogen. Both kinds are used for baths.

BOURBOULE (la) (Puy-de-Dôme, France). Altitude 2600′.

Drunk for diseases arising from impoverished blood, skin diseases, rheumatism, gout, sciatica, &c.

*Analysis* of one litre (35 fluid oz.), "Choussy" Spring:—

| | | |
|---|---|---|
| Arsenious Acid (Arsenicum ·0075) | ·0115 | grammes. |
| Hydrochloric Acid | 2·0447 | ,, |
| Sulphuric Acid | ·1098 | ,, |
| Silica | ·0420 | ,, |
| Oxide of Iron | ·0053 | ,, |
| Lime | ·0490 | ,, |
| Magnesia | ·0092 | ,, |
| Soda | 2·6395 | ,, |
| Potash | ·0731 | ,, |
| Lithia | traces | ,, |
| | 4·9841 | ,, |
| Free Carbonic Acid | ·3513 | ,, |
| Do. as Carbonates | 1·3242 | ,, |
| | 6·6596 | ,, |

*Analysis* of one litre, "Perrière" Spring:—

| | | |
|---|---|---|
| Arsenious Acid (Arsenicum ·0070) | ·0108 | grammes. |
| Chloride of Sodium | 2·8406 | ,, |
| Chloride of Potassium | ·1623 | ,, |
| Chloride of Magnesium | ·0320 | ,, |
| Bicarbonate of Soda | 2·8920 | ,, |
| Bicarbonate of Lime | ·1905 | ,, |
| Sulphate of Soda | ·2084 | ,, |
| Peroxide of Iron | ·0021 | ,, |
| Silica | ·0200 | ,, |
| Alumina | traces | ,, |
| | 6·3587 | ,, |
| Free Carbonic Acid | ·0518 | ,, |
| | 6·4105 | ,, |

BUDA-PESTH (Hungary). Bitter Aperient Water.

In 16 oz. Troy = 7680 grs.:—

| | Hunyadi Janos. | | Royal Hungarian. |
|---|---|---|---|
| | Liebig. | Bunsen. | Prof. Than. |
| Sulphate of Magnesia | 122·8 | 171·64 | 138·17 grs. |
| ,, Soda | 122·1 | 173·18 | 114·43 ,, |
| ,, Potash | ·65 | ·92 | 2·18 ,, |
| ,, Lime | — | — | 11·62 ,, |
| Chloride of Sodium | 9·98 | 13·05 | 22·13 ,, |
| Bicarbonate of Soda | 6·11 | 5·20 | 13·19 ,, |
| Carbonate of Soda | — | — | 2·09 ,, |
| Carbonate of Lime | 7·16 | 6·12 | — ,, |
| Carbonate of Strontia | — | ·20 | — ,, |
| Oxide of Iron and Alumina | ·03 | ·004 | ·05 ,, |
| Siliceous Earth | ·008 | ·08 | ·03 ,, |
| Carbonic Acid free and combined | 4·00 | 4·0 | 2·53 ,, |
| | Imported. | | Imported. |

BUDA-PESTH (Hungary)—*continued.* Victoria Ofener Bitter Water. For indigestion, hæmorrhoids, gout and rheumatism.

| *Analysis* of 16 oz. :— Temperature | Roscoe's Analysis. 63° F. | Ballo's Analysis. 59° F. | Ulex Analysis. 54° F. |
|---|---|---|---|
| Sulphate of Magnesia | 229·6749 | 226·6600 | 235·20 |
| Sulphate of Soda | 120·1851 | 146·6780 | 136·85 |
| Sulphate of Potash | 3·0849 | 2·1735 | 8·96 |
| Sulphate of Lime | 16·3128 | 11·2140 | 9·31 |
| Chloride of Sodium | 12·3956 | 15·7017 | 15·96 |
| Bicarbonate of Soda | 8·3188 | 3·4860 | 14·70 |
| Alumina | ·0756 | ·1603 | 2·10 |
| Silica | ·4109 | ·3108 | 4·20 |
| Phosphoric Acid | trace | trace | trace |
| Total Soluble Solids | 390·4586 | 406·3843 | 427·28 |
| Total Soluble Solids (found directly) | 390·0750 | 407·0920 | — |
| Specific Gravity | 1·0534 | 1·05362 | 1·055 |

BUDA or OFEN (opposite Pesth, Hungary). Altitude 461′.

Used externally. Efficacious in chronic gout, rheumatism, eczema, and psoriasis. Internally, in gastric catarrh, gouty diathesis, ulceration of the stomach, obstinate constipation. There are three swimming baths.

*Sigmundi's Analysis* of 16 oz. of the Trinkquelle :—

Temperature, 141·5° Fahr.

| | | |
|---|---|---|
| Sulphate of Soda | 2·95 | grains. |
| Chloride of Sodium | ·82 | ,, |
| Carbonate of Soda | 2·02 | ,, |
| Carbonate of Magnesia | 0·46 | ,, |
| Carbonate of Lime | 3·12 | ,, |
| Silica | 0·69 | ,, |
| Alumina | 0·18 | ,, |
| | 10·24 | grains. |
| *Gases.* | | |
| Carbonic Acid | 5·72 | c. inches. |
| Sulphuretted Hydrogen | traces. | |

BUFFALO LITHIA (Mecklenburg Co. Va., U.S.A.). Altitude 500′.

Used in the treatment of gout, rheumatism, and chronic Bright's disease.

| *Analysis* of 16 oz. :— | No. 1. | No. 2. | No. 3. |
|---|---|---|---|
| Sulphate of Magnesia | ·1530 | ·0885 | ·0150 |
| Sulphate of Alumina | ·8180 | ·9067 | ·3035 |
| Sulphate of Lime | 1·9251 | 3·3067 | ·2353 |
| Sulphate of Potash | ·0463 | — | — |
| Carbonate of Potash | — | 2·9300 | ·1852 |
| Bicarbonate of Lime | 3·9277 | 1·4963 | ·2524 |
| Bicarbonate of Lithia | ·1484 | ·2250 | traces |
| Bicarbonate of Baryta | — | ·1750 | — |
| Bicarbonate of Protoxide of Iron | ·0500 | ·0300 | ·3774 |
| Chloride of Sodium | ·1256 | ·4921 | ·0217 |
| Chloride of Silicon | ·1725 | ·1873 | ·0570 |
| Phosphoric Acid | traces | traces | traces |
| Iodine | traces | traces | — |
| Organic Matter | traces | traces | traces |
| | 7·3666 | 9·8376 | 1·4475 |
| Sulphuretted Hydrogen | ·59 cubic ins. | ·83 cubic ins. | ·34 cubic ins. |
| Carbonic Acid Gas | 6·91 ,, | 5·92 ,, | 1·16 ,, |

**BUSSANG** (Vosges, France). A ferruginous and alkaline water, mild, laxative, for weak digestion. Dose, Half-a-pint half an hour before meals.

*Analysis* of 1 Litre. (35 fluid oz.):—

| | | |
|---|---|---|
| Carbonate of Soda | ·789 | grammes. |
| Carbonate of Lime | ·340 | ,, |
| Carbonate of Magnesia | ·150 | ,, |
| Carbonate of Strontia | traces | |
| Carbonate of Iron | ·017 | ,, |
| Crenate of Iron, Manganese, and traces of Chloride of Sodium | ·078 | ,, |
| Sulphate of Soda and Lime | ·110 | ,, |
| Silicate of Soda<br>Silicate of Lime<br>Silicate of Alumina | ·002 | ,, |
| | 1·486 | ,, |
| Free Carbonic Acid | ·41 | ,, |

Imported.

**CARLSBAD** (Bohemia). Altitude 1200′. Season, June to September. Drunk for obstinate constipation, affections of liver, gout, rheumatism, and diabetes.

*Göttl's Analysis* of 16 oz. Troy = 7680 grs.:—

| | Sprudel. 162° F. | Schloss-brunnen. 122° F. | Wolf's Analysis. Markt-Brunnen. 119·3° F. |
|---|---|---|---|
| Sulphate of Soda | 19·9606 | 10·145 | 17·9919 grs. |
| Carbonate of Soda | 9·0624 | 8·555 | 9·4553 ,, |
| Chloride of Sodium | 8·7245 | 8·463 | 8·3298 ,, |
| Sulphate of Potash | ·3696 | 11·558 | 1·9603 ,, |
| Carbonate of Lime | 2·0198 | 2·419 | 2·1418 ,, |
| Carbonate of Magnesia | ·3996 | ·299 | 1·8987 ,, |
| Carbonate of Iron | ·0307 | ·023 | ·0890 ,, |
| Phosphate of Alumina | ·2150 | ·031 | 0 ,, |
| Silica | 1·0520 | ·43 | 1·3271 ,, |
| Carbonate of Lithia | 0 | 0 | ·0100 ,, |
| Carbonate of Strontia | 0 | 0 | ·0377 ,, |
| Carbonate of Manganese | 0 | 0 | ·0185 ,, |
| Iodide of Sodium | 0 | 0 | ·0209 ,, |
| Bromide of Sodium | 0 | 0 | ·0133 ,, |
| Phosphate of Soda | 0 | 0 | ·0160 ,, |
| Fluoride of Sodium and Silicium | 0 | 0 | 1·4288 ,, |
| Alumina and Peroxide of Iron | 0 | 0 | ·0251 ,, |
| | 41·8340 | 41·922 | 44·7642 grs. |
| *Gases.* | | | |
| Carbonic Acid | 7·8033 | 0 | 11·7602 |
| Nitrogen | ·0318 | 0 | ·0530 |

Imported.

Giesshübler, Temperature 7·2 to 7·5 R=45° to 45·5° F.

*Liebig's Analysis* of 16 oz. Troy=7680 grs.:—

| | |
|---|---|
| Bicarbonate of Soda | 9·6944532 |
| Chloride of Sodium | 0·3070264 |
| Sulphate of Soda | 0·3761548 |
| Sulphate of Potash | 0·5197317 |
| Bicarbonate of Lime | 2·7794533 |
| Bicarbonate of Magnesia | 2·0694743 |
| Bicarbonate of Protoxide of Iron | 0·0468486 |
| Bicarbonate of Protoxide of Manganese | 0·0375306 |
| Silicic Acid | 0·4456797 |

| | |
|---|---|
| Bicarbonate of Lithia | 0·0714685 |
| Alumina | 0·0201600 |
| Organic Matter | 0·0020474 |
| Total of Solid Constituents | 16·3700285 |
| Real free Carbonic Acid Gas | 20·6317593 |
| Total Constituents | 37·0017878 |

Imported and drunk at meals.

CAUTERET (Hautes-Pyrénées). Altitude 3000′. Climate mild and sheltered. Temperature of Sulphur baths 98° to 131° F. Season, June to September. Rich in iodine, and more exciting than Baréges. Imported.

CHALLES (Savoy). Sulphureous, milder than Baréges. Imported.

CHARLOTTENBRUNNEN (Silesia). Altitude 1437′. Sheltered. Climate mild and bracing.

Excellent arrangements for whey-cure. Is resorted to for chronic pulmonary catarrh and atonic dyspepsia.

Charlottenquelle (a mild chalybeate) contains 5½ grains of solids in 16 oz. Troy=7680 grs. Among them—

| | | |
|---|---|---|
| Carbonate of Iron | 0·2 | grains. |
| Carbonate of Soda | 1·5 | ,, |
| Carbonate of Lime | 2·3 | ,, |
| Carbonate of Magnesia | 0·5 | ,, |
| Carbonic Acid | 18 | c. in. |

Elisenquelle (acidulous spring) contains 4 grains of solids in 16 oz. Amongst them—

| | |
|---|---|
| Iron | traces. |
| Carbonic Acid | 17¼ c. in. |

CHATELDON (France). Imported.
CONDILLAC (France). Imported.
} Are gaseous drinking-waters.

CONDAL (Rubinat, Pyrenees, Spain). A non-bitter aperient water, useful in chronic indigestion, and affections of the liver and spleen, jaundice. Half a tumblerful for a dose.

*Analysis* of one gallon :—

| | | |
|---|---|---|
| Sulphate of Soda | 3123·592 | grains. |
| Sulphate of Potash. | 34·036 | ,, |
| Sulphate of Magnesia. | 215·374 | ,, |
| Sulphate of Lime | 115·792 | ,, |
| Chloride of Sodium | 130·109 | ,, |
| Silica, Alumina, and Oxide of Iron | 1·155 | ,, |
| Loss | ·635 | ,, |
| Total Saline Constituents | 3620·693 | ,, |

Imported.

CONTREXÉVILLE (Vosges, France). Climate severe. Temperature of water 53° F. Season, 20th May to 15th September. Resorted to for affections of the urinary organs.

*Analysis* of the "Pavilion Spring," by Debray :—

| | | |
|---|---|---|
| Bicarbonate of Lime | ·402 | grains. |
| Bicarbonate of Magnesia | ·035 | ,, |
| Bicarbonate of Iron | ·007 | ,, |
| Bicarbonate of Lithia | ·004 | ,, |
| Sulphate of Lime | 1·163 | ,, |
| Sulphate of Soda | ·236 | ,, |

| | |
|---|---|
| Sulphate of Magnesia | ·030 grains. |
| Silica | ·015 ,, |
| Chloride of Potassium | ·006 ,, |
| Chloride of Sodium | ·004 ,, |
| Fluoride of Calcium | traces. |
| Arsenic | traces. |
| | 2·304 ,, |
| Free Carbonic Acid | ·080 |

Imported.

*Analysis* of the "Le Cler" Spring in 16 oz.:—

| | |
|---|---|
| Bicarbonate of Lime | 2·800 grains. |
| Bicarbonate of Magnesia | ·231 ,, |
| Bicarbonate of Soda | ·056 ,, |
| Sulphate of Lime (anhydrous) | 9·730 ,, |
| Sulphate of Magnesia | 1·645 ,, |
| Sulphate of Soda | ·105 ,, |
| Chloride of Sodium | ·056 ,, |
| Silica, Iron, and Alumina | ·245 ,, |
| | 14·868 ,, |

DRIBURG (Westphalia). Altitude 583'. Mean temperature 48·5° F. Rather strong chalybeate. Temperature 51° F. Contains 40 grains in 16 oz., chiefly Bicarbonate of Lime, Sulphates of Lime, Magnesia and Soda, and 17 grains of Carbonic Acid; the quantity of Iron not stated.

EILSEN (Northern Germany). Altitude 250'. Sulphureous springs.

Useful in gout, rheumatism, and paralysis.

*Dumesnil's Analysis* in 16 oz. Troy=7680 grs.:—

| Temperature 59° F. | Georgen-brunnen | Julianen-quelle. |
|---|---|---|
| Sulphate of Soda | 5·8233 | 5·0873 grains. |
| Sulphate of Lime | 15·2840 | 17·1933 ,, |
| Sulphate of Magnesia | 5·0120 | 4·4933 ,, |
| Carbonate of Lime | 2·3333 | 1·5413 ,, |
| Carbonate of Magnesia | ·1620 | ·1866 ,, |
| Chloride of Magnesium | 1·2940 | 2·0500 ,, |
| Phosphate of Lime | ·0067 | ·0080 ,, |
| Peroxide of Iron | ·0066 | ·0080 ,, |
| Silica | traces | ·0746 ,, |
| | 30·0051 | 30·6424 grains. |
| *Gases.* | | |
| Sulphuretted Hydrogen | 1·5740 | 2·096 c. in. |
| Carbonic Acid | 1·4480 | 2·151 ,, |
| Nitrogen | ·3166 | ·374 ,, |
| Carburetted Hydrogen | ·0833 | ·110 ,, |
| Oxygen | ·0786 | ·080 ,, |
| | 3·5005 | 4·811 c. in. |

EMS (on the Lahn, Germany). Altitude 291'. Air soft and balmy. Temperature steady.

Most useful in diseases of mucous membranes and uterine derangements especially in barrenness, sluggish liver, and irritative dyspepsia.

*Fresenius's Analysis of* 16 oz. Troy=7680 grs. :—

| | Krähnchen. | Kessel-brunnen. | Fürsten-brunnen. | Neue-quelle. | |
|---|---|---|---|---|---|
| Temperature | 85° F. | 115° F. | 95° F. | 117° F. | |
| Bicarbonate of Soda . . | 14·8376 | 15·1974 | 15·6031 | 15·93 | grs. |
| Chloride of Sodium . . . | 7·0841 | 7·7705 | 7·5509 | 7·27 | ,, |
| Sulphate of Soda . . . | ·1377 | ·0061 | ·1550 | ·10 | ,, |
| Sulphate of Potash . . . | ·3286 | ·3937 | ·3014 | ·43 | ,, |
| Bicarbonate of Lime . . | 1·7246 | 1·8129 | 1·7760 | 1·78 | ,, |
| Bicarbonate of Magnesia . | 1·5051 | 1·4360 | 1·5357 | 1·54 | ,, |
| Bicarbonate of Iron . . | ·0166 | ·0278 | ·0203 | ·03 | ,, |
| Bicarbonate of Manganese | ·0072 | ·0047 | ·0060 | ·01 | ,, |
| Bicarbonate of Baryta<br>Bicarbonate of Strontia | ·0011 | ·0036 | ·0021 | ·002 | ,,<br>,, |
| Phosphate of Alumina . . | ·0032 | ·0096 | ·0033 | ·009 | ,, |
| Silica . . . . . . . . | ·3797 | ·3648 | ·3777 | ·37 | ,, |
| Total | 26·0259 | 27·0272 | 27·3322 | 27·67 | grs. |
| Carbonic Acid . . . . . | 8·3249 | 6·7886 | 6·9275 | 6·52 | c. in. |

Imported.

ENGHIEN (Paris). Altitude 52′. A valuable sulphureous water. Has five principal sources, Cotte, Deyeux, Péligot, Boulard, De la Pêcherie. Temperature from 50° to 57° F. The climate is not equal to the Pyrenees. Open from March to October. Imported.

FACHINGEN (Nassau, on the Lahn). Altitude 337′.

To correct acid in the stomach, and useful in diseases of kidney and bladder.

*Fresenius's Analysis* of 16 oz. Troy = 7680 grs. Temperature, 50° F.

| | | |
|---|---|---|
| Bicarbonate of Soda . . . . . . . . . . . . . . | 28·0883 | grains. |
| Bicarbonate of Lime . . . . . . . . . . . . . | 2·8960 | ,, |
| Bicarbonate of Magnesia . . . . . . . . . . . . | 2·2912 | ,, |
| Bicarbonate of Iron . . . . . . . . . . . . . . | ·1103 | ,, |
| Bicarbonate of Strontia . . . . . . . . . . | ·0008 | ,, |
| Bicarbonate of Lithia . . . . . . . . . . . . | ·0006 | ,, |
| Sulphate of Soda . . . . . . . . . . . . . . | ·1372 | ,, |
| Phosphate of Soda . . . . . . . . . . . . . | ·0506 | ,, |
| Phosphate of Lithia . . . . . . . . . . . . . | ·0002 | ,, |
| Phosphate of Lime . . . . . . . . . . . . . | ·0004 | ,, |
| Phosphate of Alumina . . . . . . . . . . . . | ·0003 | ,, |
| Phosphate of Silica . . . . . . . . . . . . . | ·2610 | ,, |
| Fluoride of Calcium . . . . . . . . . . . . . | ·0027 | ,, |
| Chloride of Sodium . . . . . . . . . . . . . | 4·5574 | ,, |
| Chloride of Calcium . . . . . . . . . . . . | ·0034 | ,, |
| | 38·3918 | grains. |
| *Gases.* | | |
| Carbonic Acid . . . . . . . . . . . . . . . | 32·9750 | c. in. |
| Nitrogen . . . . . . . . . . . . . . . . . | ·0256 | ,, |
| Imported. | 33·0006 | c. in. |

FRANZENSBAD (Bohemia). Altitude 1569′. Mean annual temperature 45° F.

For drinking and for baths. Highly successful in all forms of abdominal plethora, anæmia, and chlorosis. The moor-bath chalybeate for rheumatism and gout.

*Analysis* of 16 oz. :—

| | Wiesen-quelle. | Sabe-quelle. | |
|---|---|---|---|
| Temperature, Fahr. | 51° | 52·6° | |
| Carbonate of Iron | ·376 | ·016 | grains. |
| Carbonate of Manganese | ·093 | ·004 | ,, |
| Sulphate of Soda | 25·223 | 17·933 | ,, |
| Sulphate of Potash | ·1362 | 0 | ,, |
| Phosphate of Soda | ·062 | 0 | ,, |
| Chloride of Sodium | 9.346 | 9·216 | ,, |
| Bromide of Sodium<br>Iodide of Sodium | traces | 0 | |
| Carbonate of Magnesia | 1·190 | ·132 | ,, |
| Carbonate of Lithia | ·063 | 0 | ,, |
| Carbonate of Lime | 1·291 | 1·607 | ,, |
| Carbonate of Strontia | ·049 | ·003 | ,, |
| Phosphate of Lime and Alumina | ·007 | ·004 | ,, |
| Silica | ·056 | ·333 | ,, |
| | 45·108 | 38·568 | grains. |
| Carbonic Acid | 45·107 | 26·89 | c. in. |

| | Franzens-quelle. | Kalte-Sprudel. | Louisen-quelle. | |
|---|---|---|---|---|
| Temperature, Fahr. | 52·9° | 51° | 53·9° | |
| Carbonate of Iron | ·23 | ·200 | ·328 | grains. |
| Carbonate of Manganese | ·04 | ·004 | 0 | ,, |
| Chloride of Sodium | 9·23 | 8·600 | 6·766 | ,, |
| Sulphate of Soda | 24·50 | 26·930 | 21·416 | ,, |
| Carbonate of Soda | 5·17 | 7·173 | 5·498 | ,, |
| Carbonate of Lime | 1·82 | 1·600 | 1·600 | ,, |
| Carbonate of Strontia | ·003 | ·001 | 0 | ,, |
| Carbonate of Magnesia | ·67 | ·013 | 0 | ,, |
| Carbonate of Lithia | ·08 | 0 | 0 | ,, |
| Phosphate of Lime and Magnesia | ·032 | ·028 | 0 | ,, |
| Silica | ·47 | ·56 | ·228 | ,, |
| | 42·18 | 44·606 | 35·836 | grains. |
| *Gas.* | | | | |
| Carbonic Acid | 40·84 | 39·4 | 32·53 | c. inches. |

FRANZ JOSEF (Buda-Pesth). A palatable aperient water, rich in salts of Magnesium and Sodium, especially the Sulphates. Dose, from half to two wineglassfuls as an alterative and aperient.

FRIEDRICHSHALL (Saxe-Meiningen, near Hildburghausen). Situated in a charming valley. Altitude 920′. Bitter water. Alterative and aperient; used in diseases of the stomach, liver, and urinary organs.

*Liebig's Analysis* of 16 oz. Troy = 7680 grains :—

| | | |
|---|---|---|
| Sulphate of Soda | 46·51 | grains. |
| Sulphate of Magnesia | 39·55 | ,, |
| Chloride of Sodium | 61·10 | ,, |
| Chloride of Magnesium | 30·25 | ,, |
| Bromide of Magnesium | ·37 | ,, |
| Sulphate of Potash | 1·52 | ,, |
| Sulphate of Lime | 10·34 | ,, |
| Carbonate of Lime | ·11 | ,, |
| Carbonate of Magnesia | 1·16 | ,, |
| Silica | ·33 | ,, |
| | 190·25 | grains. |
| Carbonic Acid | 5·32 | c. in. |

Imported.

GASTEIN (Austria). Altitude 3051′, surrounded by mountains. Mean summer temperature, 59° F. Specially useful in nervous exhaustion.

Chiefly used for bathing. Season, July and August.

*Wolf's Analysis* of 16 oz. Troy = 7680 grs. :—

Temperature, from 95° to 118° Fahr.

| | |
|---|---|
| Sulphate of Soda | 1·51 grains. |
| Chloride of Sodium | ·36 „ |
| Carbonate of Lime | ·36 „ |
| Silica | ·24 „ |
| Carbonate of Soda | ·04 „ |
| Phosphate of Alumina | ·04 „ |
| Carbonate of Iron | ·05 „ |
| Carbonate of Manganese | ·02 „ |
| Sulphate of Potash | ·01 „ |
| Carbonate of Magnesia | ·02 „ |
| Fluoride of Calcium | traces |
| Strontia | traces |
| Organic Matter | traces |
| | 2·68 grains. |
| *Gases.* | |
| Nitrogen | 69·112 per cent. |
| Oxygen | 30·888 „ |

GEROLSTEIN (Rhenish Prussia). Altitude 1200′.

*Analysis* of 1 litre (35 fluid oz.) :—

| | |
|---|---|
| Carbonate of Soda | ·820436 grammes. |
| Carbonate of Lithia | ·001030 ,, |
| Carbonate of Lime | ·571430 ,, |
| Carbonate of Baryta | ·000089 ,, |
| Carbonate of Magnesia | ·456624 ,, |
| Carbonate of Iron | ·000316 ,, |
| Carbonate of Manganese | ·000167 ,, |
| Sulphate of Potash | ·002868 ,, |
| Sulphate of Soda | ·102627 ,, |
| Chloride of Sodium | ·251034 ,, |
| Bromide of Sodium | ·000210 ,, |
| Iodide of Sodium | ·000002 ,, |
| Phosphate of Soda | ·000221 ,, |
| Silicic Acid | ·083204 ,, |
| | 2·290258 ,, |
| Carbonic Acid in combination with Carbonates as Bicarbonates. | ·831988 ,, |

Imported and drunk as a table water.

GUBER (Srebrenica, Bosnia). A natural arsenious and ferruginous water, useful in Anæmia and Chlorosis. Dose, from one teaspoonful to two tablespoonfuls, according to age.

*Ludwig's Analysis* of 10,000 parts of water by weight :—

| | |
|---|---|
| Chloride of Sodium | 0·017 |
| Sulphate of Potassium | 0·166 |
| Sulphate of Sodium | 0·037 |
| Sulphate of Calcium | 0·209 |
| Sulphate of Magnesium | 0·219 |
| Sulphate of Protoxide of Iron | 3·734 |
| Sulphate of Manganese | 0·009 |
| Sulphate of Zinc | 0·078 |
| Sulphate of Aluminium | 2·277 |
| Free Sulphuric Acid | 0·093 |
| Acid Phosphate of Calcium | 0·010 |

| | |
|---|---|
| Anhydrous Arsenious Acid | 0·061 |
| Anhydrous Silicic Acid | 0·648 |
| Lithium and Copper | traces |
| Organic substances | 0·074 |
| Total of solid constituents | 7·539 |

HOMBURG (Central Germany). Altitude 600′. Air pure and bracing.

The springs are laxative, slightly tonic, and useful in plethora, dyspepsia, hysteria, hypochondria, etc. Source Louis, discovered in 1855, contains iron and sulphur, 32 grains of salts, and 38 cubic inches of carbonic acid. The water is also used for baths. Ludwigs-brunnen is a pleasant drinking water. Both the Kaiser-brunnen and the Stahl-brunnen have a chalybeate taste. Open all the year. Season, May to September.

*Liebig and Hofmann's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Elizabeth-brunnen. | Kaiser-brunnen. | Ludwigs-brunnen. | Stahl-brunnen. | |
|---|---|---|---|---|---|
| Temperature, Fahr. | 50° | 52·25° | 53·3° | 50° | |
| Chloride of Sodium | 79·15 | 104·94 | 47·96 | 79·86 | grs. |
| Chloride of Potassium | 0 | ·28 | 1·71 | ·18 | ,, |
| Chloride of Magnesium | 7·79 | 8·52 | 3·06 | 5·33 | ,, |
| Chloride of Calcium | 0 | 17·50 | 7·28 | 10·67 | ,, |
| Carbonate of Iron | ·46 | ·53 | ·42 | ·94 | ,, |
| Sulphate of Lime | 0 | ·17 | ·15 | ·15 | ,, |
| Carbonate of Lime | 10·99 | ·68 | 5·74 | 7·53 | ,, |
| Carbonate of Magnesia | 2·01 | 0 | ·10 | 0 | ,, |
| Sulphate of Soda | ·38 | 0 | 0 | 0 | ,, |
| Silica | ·32 | ·09 | ·20 | ·31 | ,, |
| | 108·87 | 132·71 | 66·63 | 104·97 | grs. |
| Free Carbonic Acid | 48·64 | 109·16 | 43·59 | 46·91 | c. in. |

Imported. Also the Salt evaporated to dryness imported.

HUNYADI-JANOS (*See* BUDA-PESTH).

ISCHIA (South Italy). Principal spring, Gurgitello. Temperature 158° F. Contains in 16 oz. Troy = 7680 grs., 135 grains, chiefly chloride of sodium, carbonate of soda, and carbonic acid. Serviceable in such cases as hot baths are usually employed, rheumatism, paralysis, skin disease, etc. Season, in the spring and summer. Whey cure.

Saline springs and sand baths. Temperature 108° to 133° F. Patients are immersed in these for rheumatism, gout, palsy, and scrofula.

ISCHL (Austria). Altitude 1400′. Air peculiarly soft and refreshing, and is its chief attraction. The brine from the salt-works, when diluted, is used for baths. Season, May to end of September.

JODBAD LIPIK (Slavonia, Hungary). Altitude 550′.

This is a hot Iodine Thermal Spring water, issuing at a temperature of 152·6° F. Its medicinal value is very great, and is chiefly useful in catarrhal affections of the mucous membranes of the stomach and bowels, as also in the various forms of Gout, Rheumatism, &c. ; for affections of the kidneys ; and in cases of swelling of the glands, &c.

*Heller's and Lengyel's Analysis* of 10,000 parts of the water :—

| | |
|---|---|
| Sulphate of Potash | 2·001 |
| Sulphate of Soda | 2·193 |
| Chloride of Sodium | 6·154 |
| Iodide of Sodium | 0·209 |
| Bicarbonate of Soda | 19·476 |
| Bicarbonate of Magnesium | 1·530 |
| Bicarbonate of Lime | 1·148 |
| Bicarbonate of Iron | 0·160 |
| Silica | 0·456 |
| | 33·327 |
| Carbonic Acid | 10·434 |

JOHANNISBRUNNEN (Hesse-Nassau). A clear water, stimulates the functions of the mucous membranes, and quickens the circulation of the blood. It is an excellent tonic and table water, alone or mixed with wine or cognac.

*Plaskuda's Analysis* of 16 oz. :—

| | | |
|---|---|---|
| Bicarbonate of Soda | 2·5578 | grains. |
| Bicarbonate of Potash | ·0912 | ,, |
| Bicarbonate of Lithia | ·0088 | ,, |
| Bicarbonate of Lime | 5·1823 | ,, |
| Bicarbonate of Magnesia | 2·1267 | ,, |
| Bicarbonate of Protoxide of Iron | ·0068 | ,, |
| Bicarbonate of Protoxide of Manganese | ·0145 | ,, |
| Chloride of Sodium | 7·1603 | ,, |
| Sulphate of Soda | ·2079 | ,, |
| Silicic Acid | ·0791 | ,, |
| Total Solid Constituents | 17·4360 | ,, |
| Free Carbonic Acid | 17·0667 | ,, |

KISSINGEN (Bavaria). Altitude 800′. Climate mild, dry, and salubrious. Pleasing and healthful place of residence.

The waters are laxative, and used in indigestion, obstructions of the liver, and morbid conditions of the kidneys, giving tone to the organs. The season lasts four months, May to September. There is also a Kissingen bitter-wasser, which closely resembles Friedrichshall.

*Liebig's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Rakoczi. | Pandur. | Maxbrunnen. | |
|---|---|---|---|---|
| Temperature, Fahr. | 51° | 51° | 49° | |
| Chloride of Sodium | 44·71 | 42·39 | 17·52 | grains. |
| Chloride of Potassium | 2·20 | 1·85 | 1·14 | ,, |
| Chloride of Lithium | ·15 | ·12 | ·004 | ,, |
| Chloride of Magnesium | 2·33 | 1·62 | ·51 | ,, |
| Bromide of Sodium | ·06 | ·05 | 0 | ,, |
| Iodide of Sodium | traces | traces | 0 | ,, |
| Nitrate of Soda | ·07 | ·02 | ·65 | ,, |
| Sulphate of Magnesia | 4·50 | 4·59 | 0 | ,, |
| Sulphate of Lime | 2·99 | 2·30 | 1·06 | ,, |
| Phosphate of Lime | ·04 | ·04 | ·03 | ,, |
| Carbonate of Lime | 8·14 | 7·79 | 4·62 | ,, |
| Carbonate of Iron | ·24 | ·20 | 0 | ,, |
| Silica | ·09 | ·03 | ·07 | ,, |
| | 65·70 | 61·30 | 28·10 | grains. |
| *Gases.* | | | | |
| Carbonic Acid | 41·77 | 48·17 | 41·85 | c. in. |
| Ammonia | ·007 | ·029 | 0 | ,, |

Imported.

KOSEN (Saxony, in a valley sheltered from the N. and N.E. winds). Baths. Useful in scrofulosis.

*Analysis* of 16 oz. Troy = 7680 grs. :— Temperature, Fahr. 65°.

| | | |
|---|---|---|
| Chloride of Sodium | 335·0 | grains. |
| Sulphate of Soda | 2·2 | ,, |
| Sulphate of Potash | 2·4 | ,, |
| Sulphate of Lime | 33·5 | ,, |
| Carbonate of Lime | 1·0 | ,, |
| Sulphate of Magnesia | 7·9 | ,, |
| Oxide of Iron | 0·1 | ,, |
| | 382·1 | grains. |

KŒNIGSDORFF-JASTRZEMB (Upper Silesia). Not much known. Drunk for glandular enlargements.

*Analysis* of 16 oz. Troy = 7680 grs. :—

| | | |
|---|---|---|
| Chloride of Sodium | 87·9 | grains. |
| Chloride of Potassium | 0·5 | ,, |
| Chloride of Calcium | 4·25 | ,, |
| Chloride of Magnesium | 2·6 | ,, |
| Iodide of Magnesium | ·04 | ,, |
| Bromide of Magnesium | ·22 | ,, |
| Carbonate of Lime | ·33 | ,, |
| Carbonate of Magnesia | ·01 | ,, |
| Carbonate of Iron | ·03 | ,, |
| Sulphate of Lime | ·08 | ,, |
| | 95·96 | grains. |

KRANKENHEIL (Bavaria). Altitude 2467′. Climate pure, bracing, and mild. Useful in scrofulous diseases of the skin.

*Analysis* of 16 oz. Troy = 7680 grs. :—

| | Johann-Georgen-quelle. | Bernhard-quelle. | Anna-quelle. | |
|---|---|---|---|---|
| Sulphate of Potash | ·09 | ·07 | ·15 | grains. |
| Sulphate of Soda | ·09 | ·03 | 2·25 | ,, |
| Chloride of Sodium | 1·79 | 2·27 | ·23 | ,, |
| Iodide of Sodium | ·01 | ·01 | — | ,, |
| Bicarbonate of Soda | 2·48 | 2·56 | 1·49 | ,, |
| Bicarbonate of Lime | ·70 | ·78 | 1·91 | ,, |
| Bicarbonate of Magnesia | ·22 | ·22 | — | ,, |
| Bicarbonate of Iron | — | — | — | ,, |
| Bicarbonate of Manganese | — | — | — | ,, |
| Silicate of Alumina | ·02 | ·01 | 1·84 | ,, |
| Silicic Acid | ·06 | ·07 | ·03 | ,, |
| *Gases.* | 5·50 | 5·07 | 7·98 | grains. |
| Free Carbonic Acid | ·32 | ·23 | ·63 | c. in. |
| Sulphuretted Hydrogen | ·05 | ·07 | ·23 | ,, |

KREUZNACH (Rhenish Prussia). Altitude 285′. Climate warm, clear, and dry.

Kreuznach Salt: the Mother Lye of Kreuznach, which remains after the salt has crystallised out, contains 2484 grains of solids in the 16 oz.

A strongly iodised water, powerfully tonic and stimulant to the lymphatic system, used for constitutional syphilis, diseases of the skin, rheumatism, paralysis, scrofula, tuberculosis, and leucorrhœa; used also for baths. Season, from June to September.

*Analysis* of 16 oz. Troy = 7680 grs. :—

| | Elisen-quelle. | Oranien-quelle. | Brine-Spring. | |
|---|---|---|---|---|
| Temperature, Fahr. | 54·5° | 54 5° | | |
| Chloride of Sodium | 72·883 | 108·705 | 1311·89 | grains. |
| Chloride of Calcium | 13·389 | 22·749 | 241·00 | ,, |
| Chloride of Magnesium | 4·071 | 0 | 73·22 | ,, |
| Chloride of Potassium | ·624 | ·460 | 11·23 | ,, |
| Chloride of Lithium | ·613 | 0 | 0 | ,, |
| Bromide of Magnesium | ·278 | 1·780 | 5·00 | ,, |
| Iodide of Magnesium | ·035 | ·012 | ·63 | ,, |
| Carbonate of Lime | 1·693 | ·255 | 0 | ,, |
| Carbonate of Magnesia | ·106 | ·130 | 0 | ,, |
| Carbonate of Iron | 0 | ·356 | 0 | ,, |
| Silica | ·129 | ·999 | 0 | ,, |
| Phosphate of Alumina | ·025 | ·095 | 0 | ,, |
| | 93·846 | 135·541 | 1642·97 | grains. |

The water, the salt, and the brine are all imported.

KRONDORF (Austria). A sparkling table water, may be drunk *ad lib.* It induces a healthy condition of the mucous membrane of the stomach, and acts as a powerful aid to digestion. Is useful in gout, and as a diuretic.

*Gintl's Analysis* of 10,000 grammes :—

| | | |
|---|---|---|
| Bicarbonate Oxide of Kalium | 1·63071 | grammes. |
| Bicarbonate Oxide of Natrium | 11·48577 | ,, |
| Bicarbonate Oxide of Lithium | 0·10226 | ,, |
| Bicarbonate Oxide of Magnesium | 5·79363 | ,, |
| Bicarbonate Oxide of Calcium | 4·90714 | ,, |
| Bicarbonate Oxide of Strontium | 0·00580 | ,, |
| Bicarbonate Protoxide of Manganese | 0·04696 | ,, |
| Bicarbonate Protoxide of Iron | 0·07376 | ,, |
| Sulphuric Oxide of Kalium | 0·04363 | ,, |
| Sulphuric Oxide of Natrium | 0·12769 | ,, |
| Chloride of Potassium | 0·05180 | ,, |
| Chloride of Sodium | 0·17720 | ,, |
| Phosphoric Oxide of Calcium | 0·02488 | ,, |
| Fluoride of Calcium | 0·00513 | ,, |
| Argillaceous Earth | 0·04000 | ,, |
| Silicic Acid | 0·08010 | ,, |
| Organic Substances | 0·08020 | ,, |
| Total of all the components of the Residuum | 24·77666 | ,, |
| Anhydrous Carbonic Acid | 27·73322 | ,, |
| Total of all the constituents | 52·50988 | ,, |

KRONENQUELLE (Obersalzbrunn, Silesia). It is useful in the treatment of nephritic and arthritic affections, and gouty diathesis. One or two bottles are to be taken daily, and wines and spirits avoided, or taken in limited quantity.

*Poleck's Analysis* of 16 oz. :—

| | | |
|---|---|---|
| Chloride of Sodium | ·4129 | grains. |
| Sulphate of Soda | 1·2607 | ,, |
| Sulphate of Potash | ·2860 | ,, |
| Bicarbonate of Soda | 6·1084 | ,, |
| Bicarbonate of Lithia | ·0798 | ,, |
| Bicarbonate of Lime | 4·9884 | ,, |
| Bicarbonate of Magnesia | 2·8333 | ,, |
| Bicarbonate of Strontia | ·0196 | ,, |
| Bicarbonate of Protoxide of Manganese | ·0126 | ,, |
| Bicarbonate of Protoxide of Iron | ·0639 | ,, |
| Phosphate of Alumina | ·0025 | ,, |
| Alumina | ·0032 | ,, |
| Silicic Acid | ·2422 | ,, |
| Total solid constituents | 16·3139 | ,, |

Free Carbonic Acid (at 50° Fahr. and Bar. 30) in 1,000 parts by volume . . . 84·94 parts.

KRONTHAL (Nassau). Altitude 512′. In a valley open to the south. Climate very mild.

Resorted to by persons suffering from bronchitis or affections of the lungs.

*Löwe's Analysis* of 16 oz. Troy = 7680 grs. :—

| Temperature, Fahr. | Stahl-quelle. 57° | Wilhelms-quelle. 61° |
|---|---|---|
| Chloride of Sodium | 22·27 | 27·20 grains. |
| Chloride of Potassium | ·77 | ·67 ,, |
| Chloride of Ammonium | ·07 | ·04 ,, |
| Chloride of Calcium | ·07 | ·16 ,, |
| Carbonate of Lime | 4·17 | 5·10 ,, |
| Sulphate of Lime | ·21 | ·23 ,, |
| Carbonate of Magnesia | ·72 | ·72 ,, |
| Carbonate of Iron | ·05 | ·10 ,, |
| Carbonate of Manganese | ·02 | ·01 ,, |
| Silica | ·66 | ·55 ,, |
| Organic Matter | ·11 | ·01 ,, |
| | 29·16 | 35·26 grains. |
| Carbonic Acid | 40·0 | 33·0 c. in. |

LABASSÈRE (Hautes-Pyrénées). Altitude 1800′.

Drunk for bronchial and laryngeal catarrh.

Containing 3·68 grains of solids in 16 oz. Troy = 7680 grs., viz. :—

| | Temperature, 54°—57° Fahr. |
|---|---|
| Sulphuret of Sodium | ·35 grains. |
| Chloride of Sodium | 1·58 ,, |
| Chloride of Potassium | ·02 ,, |
| Carbonate of Soda | ·17 ,, |
| Silicate of Lime | ·33 ,, |
| Silicate of Magnesia | ·07 ,, |
| Alum (in excess) | ·01 ,, |
| Iodine | traces. |
| Organic Matter | 1·11 ,, |

LANDECK (Prussian Silesia). Altitude 1398′. Climate bracing.

Vapour inhaled for bronchial catarrh. Resembles in purity Buxton and Clifton. There are moor-baths for rheumatism, etc.

*Fischer's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Wiesen-quelle. 81° F. | Georgen-brunnen. 83° F. |
|---|---|---|
| Sulphate of Soda | ·542 | ·248 grain. |
| Bicarbonate of Soda | ·545 | 0 ,, |
| Chloride of Potassium | 0 | ·165 ,, |
| Chloride of Sodium | ·005 | 0 ,, |
| Chloride of Calcium | ·064 | 0 ,, |
| Crenate of Soda | 0 | ·286 ,, |
| Sulphate of Lime | 0 | ·008 ,, |
| Carbonate of Lime | ·075 | ·081 ,, |
| Carbonate of Magnesia | ·005 | ·009 ,, |
| Phosphate of Alumina, Iron, and Manganese | 0 | ·012 ,, |
| Silica | ·327 | ·271 ,, |
| | 1·563 | 1·122 grains. |
| *Gases.* | | |
| Sulphuretted Hydrogen | ·015 | traces. c. in. |
| Carbonic Acid | ·172 | ·26 ,, |
| Nitrogen | 0 | ·62 ,, |

LANGENBRÜCKEN (Baden). Altitude 440′. In a valley, with luxuriant foliage. Climate mild. Season, spring to autumn.

Useful in chronic catarrh of the bladder, rheumatism, and bronchial irritation.

Trinkquelle. Temperature, 52° Fahr. Contains $3\frac{3}{4}$ grains of solids in 16 oz. Troy = 7680 grs. viz. :—

| | | |
|---|---|---|
| Sulphate of Soda | ·25 | grains. |
| Sulphate of Lime | ·5 | ,, |
| Sulphate of Potash | ·15 | ,, |
| Chloride of Sodium | ·08 | ,, |
| Carbonate of Lime | 2·12 | ,, |
| Carbonate of Magnesia | ·35 | ,, |
| Carbonate of Iron | ·07 | ,, |
| Silica | ·01 | ,, |
| *Gases.* | | |
| Sulphuretted Hydrogen | 0·10 | c. in. |
| Carbonic Acid | 27·98 | ,, |

Waldquelle. Temperature, 57° F. Contains $11\frac{3}{4}$ grains of solids in 16 oz. Troy = 7680 grs. viz. :—

| | | |
|---|---|---|
| Sulphate of Soda | 1·63 | grains. |
| Sulphate of Magnesia | 3·88 | ,, |
| Sulphate of Lime | 2·41 | ,, |
| Phosphate of Lime | ·16 | ,, |
| Sulphate of Potash | ·15 | ,, |
| Sulphuret of Calcium | ·14 | ,, |
| Chloride of Potassium | ·10 | ,, |
| Carbonate of Lime | 1·81 | ,, |
| Carbonate of Magnesia | 1·84 | ,, |
| Sulphuret of Iron | ·03 | ,, |
| Alumina | ·03 | ,, |
| Silica | ·13 | ,, |
| *Gases.* | | |
| Sulphuretted Hydrogen | ·15 | c. in. |
| Carbonic Acid | 3·09 | ,, |

LEUK (Switzerland). Altitude, 4275′, at the foot of the Gemmi. Climate rough and bracing.

Both sexes, in suitable dresses, promenade in these baths. They are useful in skin diseases, chronic swellings of the glands, in catarrh, and have also a diuretic action.

*Brunner's Analysis* of 16 oz. Troy = 7680 grs., of the Lorenzquelle :—

Temperature, 124° F.

| | | |
|---|---|---|
| Sulphate of Lime | 12·712 | grains. |
| Sulphate of Magnesia | 1·991 | ,, |
| Sulphate of Soda | ·509 | ,, |
| Sulphate of Strontia | ·031 | ,, |
| Chloride of Sodium | ·055 | ,, |
| Chloride of Potassium | ·02 | ,, |
| Chloride of Magnesium | ·027 | ,, |
| Carbonate of Lime | ·357 | ,, |
| Carbonate of Magnesia | ·002 | ,, |
| Carbonate of Iron | ·024 | ,, |
| Silica | ·102 | ,, |
| | 15·830 | grains. |
| *Gases.* | | |
| Carbonic Acid | ·267 | c. in. |
| Oxygen | ·192 | ,, |
| Nitrogen | ·347 | ,, |

LEVICO (Austrian Tyrol). Altitude 4500′.

It has two arsenical springs, one being about ten times stronger than the other. Strong Levico contains about $\frac{1}{13}$ grain of Arsenious Acid and 33 grains of Iron salts per pint.

*Ludwig von Barth's Analyses.*

In one litre (35 fluid oz.) of Levico *strong*:—

| | | |
|---|---|---|
| Arsenious Acid | ·0086879 | grammes. |
| Chloride of Sodium | ·0001781 | ,, |
| Proto-sulphate of Iron | 2·5675198 | ,, |
| Per-sulphate of Iron | 1·3019720 | ,, |
| Sulphate of Aluminium | ·6239873 | ,, |
| Sulphate of Manganese | ·0002418 | ,, |
| Sulphate of Calcium | ·3724983 | ,, |
| Sulphate of Magnesium | ·3833451 | ,, |
| Sulphate of Potassium | ·0037031 | ,, |
| Sulphate of Sodium | ·0312031 | ,, |
| Sulphate of Ammonium | ·0032270 | ,, |
| Silicic Acid | ·0310384 | ,, |
| Carbon from Organic matter | ·0097825 | ,, |

In one litre (35 fluid oz.) of Levico *mild*:—

| | | |
|---|---|---|
| Arsenious Acid | ·00095 | grammes. |
| Chloride of Sodium | ·00003 | ,, |
| Proto-sulphate of Iron | ·66278 | ,, |
| Per-sulphate of Iron | ·27272 | ,, |
| Sulphate of Aluminium | ·15919 | ,, |
| Sulphate of Copper | ·00520 | ,, |
| Proto-carbonate of Iron | ·01558 | ,, |
| Sulphate of Manganese | ·00003 | ,, |
| Sulphate of Magnesium | ·23648 | ,, |
| Sulphate of Calcium | ·32477 | ,, |
| Sulphate of Sodium | ·01579 | ,, |
| Sulphate of Potassium | ·00099 | ,, |
| Sulphate of Ammonium | ·00062 | ,, |
| Silicic Acid | ·02293 | ,, |

LIPPIK (Slavonia).

Useful in hysteria.

KLEINBADQUELLE contains 20 grains of solids in 16 oz. Troy = 7680 grs., viz. :—

Temperature 111° F.

| | | |
|---|---|---|
| Sulphate of Soda | 5·25 | grains. |
| Chloride of Sodium | 4·8 | ,, |
| Chloride of Calcium | ·75 | ,, |
| Iodide of Calcium | ·2 | ,, |
| Carbonate of Soda | 9·5 | ,, |
| Carbonate of Magnesia | ·75 | ,, |
| Carbonate of Lime | 1·33 | ,, |
| Phosphate of Alumina | ·02 | ,, |
| Silica | ·08 | ,, |

*Gases.*

| | | |
|---|---|---|
| Carbonic Acid | 28·5 | per cent. |
| Nitrogen | 71·4 | , |

LIPPSPRINGE (Prussian Westphalia). Altitude 378′, having beautiful walks for exercise. Climate mild, calming, and equable.

Useful in bronchial irritation and incipient tuberculosis. Season, June to August.

**Arminiusquelle**, in 16 oz. Troy = 7680 grs. are:—

Temperature 70° F.

| | |
|---|---|
| Sulphate of Lime | 4·25 grains. |
| Carbonate of Lime | 5·27 ,, |
| Sulphate of Soda | 5·20 ,, |
| Bicarbonate of Soda | 1·60 ,, |
| Sulphate of Magnesia | ·80 ,, |
| Carbonate of Magnesia | ·60 ,, |
| Carbonate of Iron | ·14 ,, |
| Chloride of Sodium | ·86 ,, |
| Chloride of Magnesium | ·80 ,, |
| Iodides | traces. |
| | 19·52 grains. |

*Gases.*

| | |
|---|---|
| Carbonic Acid | 16·17 c. in. |
| Nitrogen | 4·46 ,, |
| Oxygen | ·55 ,, |
| | 21·12 c. in. |

LUCCA (Central Italy). Situate on the slope of a hill, surrounded with shady trees. Climate warm.

Employed externally and internally for skin diseases and chronic rheumatism. Season, June, July, and August.

*Giulii's Analysis* of 16 oz. Troy = 7680 grs. of thermal spring:—

Temperature, 116° F.

| | |
|---|---|
| Sulphate of Lime | 5·82 grains. |
| Carbonate of Lime | ·39 ,, |
| Carbonate of Magnesia | ·06 ,, |
| Chloride of Sodium | 1·28 ,, |
| Chloride of Magnesium | ·32 ,, |
| Alumina | ·32 ,, |
| Sulphate of Magnesia | 1·18 ,, |
| | 9·37 grains. |

LUHATSCHOWITZ (Moravia). Altitude 1600′. Climate mild but moist.

Useful in chronic bronchial, gastric, uterine, and vaginal catarrh, especially if combined with scrofulosis; in congested liver and hæmorrhoids, arising from sedentary habits.

*Analysis* of 16 oz.:—

| | Vincenz-brunnen. | Amand-brunnen. | Johann-brunnen. | Luisen-quelle. | Bade-wasser. | |
|---|---|---|---|---|---|---|
| Temperature, Fahr. | 47·75° | 45·7° | 45·7° | 48·6° | | |
| Chloride of Potassium | 1·79 | 1·59 | 2·14 | 1·61 | 1·85 | grains. |
| Chloride of Sodium | 23·35 | 25·75 | 27·88 | 33·47 | 20·87 | ,, |
| Bromide of Sodium | ·25 | ·10 | ·07 | ·08 | ·11 | ,, |
| Iodide of Sodium | ·13 | ·12 | ·17 | ·18 | ·35 | ,, |
| Carbonate of Soda | 23·26 | 36·03 | 44·21 | 43·21 | 24·13 | ,, |
| Carbonate of Lithia | 0 | ·01 | ·01 | ·01 | 0 | ,, |
| Carbonate of Magnesia | ·42 | ·56 | ·55 | ·51 | ·42 | ,, |
| Carbonate of Baryta | ·07 | ·06 | ·04 | ·06 | 0 | ,, |
| Carbonate of Lime | 4·63 | 4·81 | 4·89 | 4·40 | 4·79 | ,, |
| Carbonate of Strontia | ·09 | ·11 | ·07 | ·12 | 0 | ,, |
| Carbonate of Iron | ·11 | ·13 | ·09 | ·18 | ·15 | ,, |
| Silica | ·39 | ·10 | ·41 | ·47 | ·14 | ,, |
| | 54·85 | 69·5 | 80·7 | 84·4 | 59·7 | grains. |
| Carbonic Acid | 50·0 | 29·0 | 16·0 | 27·6 | 28·0 | c. in. |

MARIENBAD (Bohemia). Altitude 1900′. Air dry and pure. Season, May to September.

Springs are drunk as laxatives, and are useful in abdominal enlargement, gravel, gout, and derangement of the digestive organs. Mud-baths are applied to stimulate the skin, and to remove glandular swellings.

In 16 oz. Troy = 7680 grs. :—

| | Kreuz-brunnen. | Ferdinand-brunnen. | Wald-quelle. | Wiesen-quelle. | Marien-quelle. | |
|---|---|---|---|---|---|---|
| Temperature, Fahr. | 53·3° | | 43·25° | 52°—54° | | |
| Sulphate of Soda . . . | 36·269 | 38·766 | 5·228 | ·883 | ·353 | grs. |
| Bicarbonate of Soda . . | 12·394 | 13·999 | 5·107 | ·704 | 0 | ,, |
| Chloride of Sodium . . | 11·166 | 15·397 | 2·116 | ·369 | ·048 | ,, |
| Sulphate of Potash . . | ·449 | ·499 | 1·495 | 0 | 0 | ,, |
| Bicarbonate of Lithia . | ·077 | ·110 | ·009 | 0 | 0 | ,, |
| Bicarbonate of Lime . . | 6·630 | 6·021 | 2·725 | 6·516 | ·436 | ,, |
| Bicarbonate of Strontia . | ·017 | ·008 | 0 | 0 | 0 | ,, |
| Bicarbonate of Magnesia. | 5·399 | 5·299 | 0 | 4·373 | ·061 | ,, |
| Bicarbonate of Iron . . | ·482 | ·653 | ·187 | ·373 | ·035 | ,, |
| Bicarbonate of Manganese | ·053 | ·166 | ·035 | ·161 | 0 | ,, |
| Phosphate of Alumina . | ·054 | ·014 | ·011 | 0 | 0 | ,, |
| Phosphate of Lime. . . | ·018 | ·015 | 0 | 0 | 0 | ,, |
| Silica . . . . . . . . | ·079 | ·741 | ·507 | ·691 | ·189 | ,, |
| | 73·736 | 81·515 | 20·091 | 14·070 | 1·197 | grs. |
| Carbonic Acid . . . . | 7·424 | 14·800 | 13·509 | 12·828 | 9·056 | c. in. |

Imported.

| | Carolinen-brunnen. | Ambrosius-brunnen. | |
|---|---|---|---|
| Temperature, Fahr. | 50° | 50° | |
| Sulphate of Soda . . . . . . . . . | 2·79 | 1·86 | grains. |
| Chloride of Sodium . . . . . . . . | ·82 | 1·64 | ,, |
| Carbonate of Soda . . . . . . . . | ·20 | 1·66 | ,, |
| Carbonate of Lime . . . . . . . . . | 3·66 | 2·89 | ,, |
| Carbonate of Magnesia . . . . . . . | 3·94 | 2·72 | ,, |
| Carbonate of Iron . . . . . . . . . | ·44 | ·34 | ,, |
| Silica . . . . . . . . . . . . . . | ·46 | ·48 | ,, |
| Extractive Substance . . . . . . . | ·38 | 0 | ,, |
| Carbonic Acid . . . . . . . . . . . | 15·43 | 12·9 | c. in. |

MEINBERG (Germany). Altitude 634′. Situated in a charming fertile plain.

These waters are generally tonic, and good in facial neuralgia, relaxed condition of system, whether cutaneous or otherwise.

In 16 oz. Troy = 7680 grs. are contained as follows :—

| | Trink-quelle. | Neu-brunnen. | Quelle im Stern. | Schwefel-quelle. | Kochsalz-quelle. | Acidulous Spring. | |
|---|---|---|---|---|---|---|---|
| Temperature. | | | | 61° F. | | | |
| Sulphate of Soda. . . | 1·15 | 4·51 | 1·34 | 5·84 | 11·01 | 0 | grs. |
| Sulphate of Magnesia . | 1·14 | 2·52 | 3·67 | 1·73 | 0 | 0·04 | ,, |
| Sulphate of Lime . . | 0·28 | 3·45 | 15·16 | 8·33 | 13·46 | 0·18 | ,, |
| Chloride of Sodium . . | 0 | 0 | 0 | 0 | 40·95 | 0·07 | ,, |
| Chloride of Magnesia . | 0·81 | 0·98 | 0·24 | 1·03 | 6·31 | 0·14 | ,, |
| Carbonate of Lime . . | 1·45 | 2·65 | 1·17 | 2·14 | 6·03 | 5·02 | ,, |
| Carbonate of Magnesia. | 0·15 | 0·24 | 0·17 | 0·17 | 0·51 | 2·04 | ,, |
| Carbonate of Iron . . | 0·08 | 0·07 | 0·01 | 0·008 | 0·07 | 0·005 | ,, |
| Silica. . . . . . . . | 0·06 | 0·25 | 0·08 | 0·12 | 0·05 | 0·05 | ,, |
| Extractive Substance . | 0·57 | 0 | 0 | 0 | 0 | 0 | ,, |
| | 5·96 | 14·73 | 23·36 | 19·48 | 73·44 | 7·57 | ,, |
| *Gases.* | | | | | | | |
| Carbonic Acid . . . | 34·36 | 0 | 1·83 | 2·12 | 9·74 | 18·49 | c. in. |
| Sulphuretted Hydrogen | 0 | 0 | 0 | 0·55 | 0 | 0 | ,, |
| Nitrogen . . . . . | 0·14 | 0 | 0 | 0 | 0 | 0 | ,, |

MERGENTHEIM (Würtemburg). Altitude 591′. Charming situation. Climate mild. Mean annual temperature 51° F., mean summer temperature 64° F.

The concentrated bitter-water contains 235 grains in the 16 oz. Troy = 7680 grs. The water is used internally and externally in biliary obstructions, hæmorrhoids, and lithiasis.

The "Quelle im Carlsbad" spring contains about 107 grains of solids in 16 oz. Troy = 7680 grs. viz.:—

| | |
|---|---|
| Chloride of Sodium | 51·25 grains. |
| Chloride of Potassium | ·78 " |
| Chloride of Lithium | ·01 " |
| Bromide of Sodium | ·07 " |
| Sulphate of Soda | 21·89 " |
| Sulphate of Magnesia | 15·88 " |
| Sulphate of Lime | 9·86 " |
| Carbonate of Magnesia | 1·40 " |
| Carbonate of Lime | 5·45 " |
| Carbonate of Iron | ·05 " |
| Silica | ·45 " |
| | 107·16 grains. |
| *Gases.* | |
| Carbonic Acid | 7·5 c. in. |
| Nitrogen | 18·0 " |

MONDORF (Luxembourg). Altitude 2278′. Surrounded by beautiful shady walks.

Extremely useful in hyperæmic conditions of the mucous membrane of the respiratory or intestinal functions, especially in leuco-phlegmatic anæmic individuals.

There is an artesian well here, 2278 feet deep, and the water out of it is 108·5° F.

*Kirchhoff's Analysis* of 16 oz. Troy = 7680 grs.:—

Temperature, 77° Fahr.

| | |
|---|---|
| Chloride of Sodium | 66·98 grains. |
| Chloride of Calcium | 24·31 " |
| Chloride of Potassium | 1·58 " |
| Chloride of Magnesium | 3·25 " |
| Bromide of Magnesium | ·76 " |
| Sulphate of Lime | 12·61 " |
| Carbonate of Magnesia | ·05 " |
| Carbonate of Iron | ·22 " |
| Silica | ·05 " |
| Arsenic Acid | ·001 " |
| | 109·911 grains. |
| *Gases.* | |
| Free Carbonic Acid | 1·06 c. in. |
| Nitrogen | ·47 " |

NENNDORF (Prussian Westphalia). Environs charming.

Used for drinking and for baths, to increase the tone of the skin. Gas, douche, and mud baths are employed for gout and rheumatism, etc. Brine baths are also employed. Season, June to September.

In 16 oz. Troy = 7680 grs.:—

| Temperature, 52° F. | Quelle unter dem Gewölbe. | Trink-brunnen. | Bade-quelle. | Sool of Rodenberg. |
|---|---|---|---|---|
| Sulphate of Soda . . | 5·22 | 4·91 | 1·11 | 10·81 grs. |
| Sulphate of Magnesia . | 2·83 | 2·54 | 1·89 | 10·01 ,, |
| Sulphate of Lime . . | 7·15 | 6·31 | 5·56 | 14·82 ,, |
| Sulphate of Potash . . | 0 | 0 | 0 | 0·10 ,, |
| Chloride of Sodium . | 0 | 0 | 0 | 49·84 ,, |
| Chloride of Magnesium | 1·63 | 1·62 | 0·42 | 10·01 ,, |
| Chloride of Calcium . | 4·30 | 4·51 | 3·18 | 4·61 ,, |
| Silica . . . . . . | 0·05 | 0·06 | 0 | 0·20 ,, |
|  | 21·4 | 20·7 | 12·19 | 90·0 grs. |
| *Gases.* |  |  |  |  |
| Carbonic Acid . . . | 5·2 | 4·32 | 2·75 | 0·14 c. in. |
| Sulphuretted Hydrogen | 1·21 | 1·20 | 0·61 | 0 ,, |

NEUENAHR (Rhenish Prussia). Altitude 225′. Scenery picturesque and romantic. Climate mild.

Good for gout and rheumatism, scrofula, emphysema of the lungs, bronchial catarrh, uric acid diathesis, and all diseases of the mucous membrane.

Contents in 16 oz. Troy = 7680 grains:—

|  | Augusten-quelle. | Mohr-Marien-sprudel. | Bisch. Apollinaris-brunnen. | Victoria-quelle. |
|---|---|---|---|---|
| Temperature, Fahr. | 90° | 102° | 70° |  |
| Carbonate of Soda . . | 5·99 | 5·62 | 9·65 | 10·80 grs. |
| Carbonate of Magnesia | 1·77 | 2·68 | 3·39 | 3·74 ,, |
| Carbonate of Lime . . | 1·68 | 1·61 | ·45 | 3·30 ,, |
| Chloride of Sodium . | ·71 | ·69 | 3·57 | 0·91 ,, |
| Sulphate of Soda . . | ·58 | ·76 | 2·30 | 0·73 ,, |
| Oxide of Iron . . . | ·04 | 0·06 | 0·15 | 0·10 ,, |
| Alumina . . . . . . | ·13 |  |  |  |
| Silica . . . . . . . | ·17 | 0·19 | 0·06 | 0·25 ,, |
|  | 11·11 | 11·66 | 19·59 | 19·83 grs. |
| Carbonic Acid . . . | 24·73 | 22·52 | 47·04 | 12·86 c. in. |

Apollinaris is imported for drinking as a table water.

OBERSALZBRUNN (Salzbrunn, Silesia). A lithiated water, useful in nephritic affections and gouty diathesis.

Constituents in 1,000 parts by weight of water. Carbonate salts reckoned as anhydrated bicarbonates:—

|  | Ober-brunnen. |  | Mühl-brunnen. | Neue Quelle. |
|---|---|---|---|---|
|  | Valentiner. 1866. | Ziurek. 1869. | Valentiner. 1866. | Ziurek. 1869. |
| Bicarbonate of Soda. . . . | 2·4240 | 2·2264 | 1·8033 | 1·2855 |
| Chloride of Sodium . . . . | 0·1719 | 0·1982 | 0·0856 | 0·1025 |
| Sulphate of Soda. . . . . | 0·4773 | 0·2332 | 0·3408 | 0·4018 |
| Bicarbonate of Lithia . . . | 0·0138 | 0·0071 | 0·0077 | 0·0083 |
| Bicarbonate of Magnesia . . | 0·5044 | 0·3916 | 0·5823 | 0·6148 |
| Bicarbonate of Lime. . . . | 0·4781 | 0·5052 | 0·5843 | 0·5472 |
| Bicarbonate of Strontia. . . | 0·0047 | trace. | 0·0088 | trace. |
| Bicarbonate of Oxide of Iron. | 0·0003 | 0·0171 | 0·0011 | 0·0307 |
| Sulphate of Potash . . . . | 0·0268 | 0·3519 | 0·0081 | 0·0025 |
| Silicic Acid . . . . . . . | 0·0255 | 0·0331 | 0·0323 | 0·0391 |
| Total Solid Constituents . | 4·1268 | 3·9638 | 3·4543 | 3·0324 |
|  | cc. | cc. | cc. | cc. |
| Volume of Free Carbonic Acid Gas in 1,000 cubic centimetres of water . . | 630·49 | 370·58 | 626·84 | 646·42 |
|  | 7·5° Cent. |  | 6·3°-7·5° Cent. |  |
| Temperature . . . . . . | 36·1° Fahr. | — | 35·5°-36·2° F. |  |

OREZZA (Corsica). Air warm. Temperature, 59° F.

Is a kind of ferruginous Seltzer Water, very agreeable to drink. It is drunk with pleasure and with benefit for indigestion, want of appetite, and general debility.

*Analysis* of 1000 grammes:—

| | |
|---|---|
| Carbonate of Lime | ·602 grammes. |
| Carbonate of Magnesia | ·074 ,, |
| Carbonate of Protoxide of Iron | ·128 ,, |
| Sulphate of Lime | ·021 ,, |
| Chloride of Potash | ·014 ,, |
| Chloride of Soda | |
| Aluminium | ·006 ,, |
| Silicic Acid | ·004 ,, |
| | ·849 grammes. |
| Free Carbonic Acid | 1·248 litres. |

Imported.

OTTILIENQUELLE (Paderborn, Westphalia).

For incipient tuberculosis, great emaciation, etc.; in short, they are both tonic and restorative.

*Analysis* of 16 oz. Troy = 7680 grains:—

| | |
|---|---|
| Carbonate of Lime | 2·5 grains. |
| Carbonate of Iron | ·05 ,, |
| Chloride of Sodium | 6·75 ,, |
| Sulphate of Lime | ·5 ,, |
| Chloride of Calcium | ·5 ,, |
| Chloride of Magnesium | ·25 ,, |
| Iodine and Bromine | traces. |
| | 10·55 grains. |
| *Gases.* | |
| Carbonic Acid | 2·34 c. in. |
| Nitrogen | 8·98 ,, |
| Oxygen | 1·17 ,, |

MARIENQUELLE (in the neighbourhood), a chalybeate, contains 4¾ grains of solids. Amongst them—

| | |
|---|---|
| Carbonate of Lime | 1·75 grains. |
| Bicarbonate of Iron | ·45 ,, |

PFAFFERS (Switzerland), altitude 2108′, and RAGATZ, altitude 1604′, which has the same water conveyed to it.

Pfaffers is situated in a ravine, and is the most valued; Ragatz is in an open country, with purer air. They are chiefly valued for the warmth of their springs. Season, June to September.

*Capeller's Analysis* of 16 oz. Troy = 7680 grains:—

Temperature, 100° F.

| | |
|---|---|
| Carbonate of Magnesia | ·87 grains. |
| Carbonate of Lime | ·32 ,, |
| Sulphate of Soda | ·62 ,, |
| Sulphate of Lime | ·37 ,, |
| Chloride of Sodium | ·21 ,, |
| Chloride of Magnesium | ·16 ,, |
| *Gases.* | 2·55 grains. |
| Oxygen | 1·3 c. in. |
| Nitrogen | 3·7 ,, |
| Carbonic Acid | 4·15 ,, |

PLOMBIÈRES (Vosges, France). Altitude 1310′. Air bracing and pure, subject to change of temperature.

Chiefly used as baths, and Dr. Hebra's beds are used to keep patients immersed for days together; most suitable for gout, rheumatism, spinal, and female complaints. There are, also, cool chalybeate springs for drinking. Often visited by the late Emperor Napoleon III.

*Analysis* of 16 oz. Troy=7680 grs.:—

| Temperature, from 80° to 159° F. | Bain des Dames. | Bain Romain. |
|---|---|---|
| Silicate of Soda | ·6257 | ·5278 grain. |
| Silicate of Potash | ·0080 | 0 ,, |
| Silicate of Lime and Magnesia | ·1530 | ·052 ,, |
| Chloride of Sodium<br>Chloride of Potassium<br>Chloride of Calcium | ·2754 | ·2290 ,, |
| Sulphate of Soda | ·6273 | ·3901 ,, |
| Arseniate of Soda | ·0053 | 0 ,, |
| Silica | ·0887 | ·3213 ,, |
| Alumina | ·0760 | ·1980 ,, |
| Nitrogenous organic matter | ·1530 | 0 ,, |
| | 2·0024 | 1·6759 grains. |

Imported.

POUGUES (Loire, France). Altitude 780′.

| *Analysis* of 1 Litre (35 fluid oz.):— | "St. Leger" Spring. |
|---|---|
| Bicarbonate of Lime | 1·3269 grammes. |
| Bicarbonate of Magnesia | ·9762 ,, |
| Bicarbonate of Soda with traces of Potash | ·6362 ,, |
| Bicarbonate of Iron | ·0206 ,, |
| Sulphate of Soda | ·2700 ,, |
| Sulphate of Lime | ·1900 ,, |
| Chloride of Magnesium | ·3500 ,, |
| Silicic Acid and Alumina | ·0350 ,, |
| Glairine | ·0300 ,, |
| | 3·8349 grammes. |

PULLNA (Bohemia).

A bitter saline purgative, twice the strength of Seidlitz, useful in obstinate constipation.

*Struve's Analysis* of 16 oz. Troy = 7680 grs.:—

| | |
|---|---|
| Sulphate of Soda | 123·800 grains. |
| Sulphate of Potash | 4·800 ,, |
| Sulphate of Lime | 2·600 ,, |
| Carbonate of Lime | ·770 ,, |
| Sulphate of Magnesia | 93·086 ,, |
| Chloride of Magnesium | 16·666 ,, |
| Carbonate of Magnesia | 6·406 ,, |
| Phosphate of Lime | ·003 ,, |
| Silica | ·176 ,, |
| | 248·307 grains |

Carbonic Acid Gas.

Imported.

PYRMONT (Waldeck). Altitude 404′. In a valley; the environs picturesque. Mean annual temperature, 48·5° F.

Chalybeate drinking springs, taste fresh and slightly ferruginous. The saline somewhat bitter; they are highly restorative. There is also a Grotto del Cane here.

*Wigger's Analysis* of 16 oz. Troy = 7680 grs. :—

| Temperature, 51°—54½° F. | Trink-quelle. | Brodel-brunnen. | Augen-quelle. | Neu-brunnen. | Sool-quelle. | Myr. Sal. quelle. | Säur-ling. | |
|---|---|---|---|---|---|---|---|---|
| Sulphate of Lime . . | 7·22 | 6·07 | 4·10 | 0 | 14·58 | 5·51 | ·31 | grs. |
| Sulphate of Magnesia | 2·69 | 5·53 | 4·56 | 3·47 | 2·33 | 0 | ·60 | „ |
| Sulphate of Soda . . | 2·14 | 0 | 1·71 | 7·34 | 5·29 | 12·24 | ·37 | „ |
| Carbonate of Lime . | 5·98 | 4·52 | 3·81 | 7·86 | 2·71 | 6·92 | 1·81 | „ |
| Carbonate of Magnesia | ·32 | ·24 | ·25 | ·96 | ·46 | 0 | ·16 | „ |
| Carbonate of Soda . | 0 | 4·78 | ·84 | 2·62 | 1·49 | 6·23 | ·30 | „ |
| Carbonate of Iron . . | ·49 | ·58 | ·13 | ·75 | ·08 | ·06 | 0 | „ |
| Chloride of Sodium . | 0 | 0 | ·44 | 4·38 | 61·68 | 65·49 | ·01 | „ |
| Chloride of Magnesium | 1·12 | 1·48 | ·45 | ·97 | 6·92 | 12·07 | ·12 | „ |
| Silica . . . . . . . | ·49 | ·25 | ·10 | ·20 | 0 | 0 | 0 | „ |
| | 20·02 | 23·62 | 16·46 | 28·98 | 95·32 | 108·7 | 3·72 | grs. |
| Carbonic Acid . . | 44·52 | 38·51 | 36·28 | 39·28 | 17·46 | 26·19 | 21·84 | c. in. |
| Sulphuretted Hydrogen | 0 | 0 | ·39 | 0 | 0 | 0 | 0 | |

Imported.

RAKOCZI (*See* KISSINGEN), Bavaria.

RECOARO (Venetia). Altitude 1465′. Climate mild and bracing.

Situate at the foot of the Alps. Chiefly resorted to for the mild air and chalybeate springs. Season, May to October.

*Cenedella's Analysis* of 16 oz. Troy = 7680 grs. :—

| | | |
|---|---|---|
| Carbonate of Iron . . . . . . . . . . . . . . | ·23 | grains. |
| Carbonate of Lime . . . . . . . . . . . . . . | 5·15 | „ |
| Carbonate of Magnesia . . . . . . . . . . . . | ·47 | „ |
| Carbonate of Soda . . . . . . . . . . . . . . | 0 | „ |
| Sulphate of Magnesia . . . . . . . . . . . . . | 5·00 | „ |
| Sulphate of Soda . . . . . . . . . . . . . . | ·23 | „ |
| Sulphate of Lime . . . . . . . . . . . . . . | 9·5 | „ |
| Chloride of Magnesium . . . . . . . . . . . . | ·023 | „ |
| Silica . . . . . . . . . . . . . . . . . . | ·319 | „ |
| | 20·78 | grains. |
| *Gas.* | | |
| Carbonic Acid . . . . . . . . . . . . . . . | 17·99 | c. in. |

REICHENHALL (Upper Bavaria). Altitude 1407′. Mean temperature of spring, 56° F.; of summer, 64° F.; of autumn, 54° F. Climate mild and bracing.

Used only for baths, for scrofula and incipient tuberculosis, and for inhalation. Season, July and August.

Of the nineteen saline springs, the most abundant is

The "EDELQUELLE," which contains in 16 oz. Troy = 7680 grs. :—

| | | |
|---|---|---|
| Chloride of Sodium . . . . . . . . . . . . . | 1723·10 | grains. |
| Chloride of Ammonium . . . . . . . . . . . | ·19 | „ |
| Chloride of Magnesium . . . . . . . . . . . | 13·84 | „ |
| Bromide of Magnesium . . . . . . . . . . . | ·23 | „ |
| Sulphate of Soda . . . . . . . . . . . . . | 15·36 | „ |
| Sulphate of Potash . . . . . . . . . . . . . | 4·70 | „ |
| Sulphate of Lime . . . . . . . . . . . . . | 31·98 | „ |
| Carbonate of Lime . . . . . . . . . . . . . | ·07 | „ |
| Carbonate of Magnesia . . . . . . . . . . . | traces. | |
| Oxide of Iron and Alumina . . . . . . . . . . | ·06 | „ |
| Silica . . . . . . . . . . . . . . . . . | ·08 | „ |
| | 1789·61 | grains |
| Free Carbonic Acid . . . . . . . . . . . . | traces. | |

RIPPOLDSAU (Baden). Altitude 1886′. Air pure, fresh, and bracing. Tonic resolvent for chlorotic and anæmic patients; also useful in pulmonary catarrh. Season, middle of May to middle of September.

*Bunsen's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Josephquelle. | Leopoldsquelle. | |
|---|---|---|---|
| Temperature, Fahr. | 46° | 49° | |
| Bicarbonate of Iron | ·395 | ·455 | grains. |
| Bicarbonate of Manganese | ·033 | ·078 | „ |
| Bicarbonate of Lime | 12·939 | 14·598 | „ |
| Bicarbonate of Magnesia | ·543 | 2·888 | „ |
| Sulphate of Soda | 9·316 | 6·789 | „ |
| Sulphate of Potash | ·465 | ·271 | „ |
| Sulphate of Lime | ·428 | ·134 | „ |
| Sulphate of Magnesia | 1·866 | ·150 | „ |
| Phosphate of Lime | 0 | ·136 | „ |
| Chloride of Magnesium | ·650 | ·336 | „ |
| Alumina | ·034 | ·120 | „ |
| Silica | ·439 | ·663 | „ |
| Phosphoric Acid<br>Arsenic and organic matter | traces. | traces. | |
| | 26·908 | 26·853 | grains. |
| *Gases.* | | | |
| Free Carbonic Acid | 14·936 | 15·985 | c. in. |
| Nitrogen | ·003 | ·003 | „ |
| Oxygen | 0 | ·003 | „ |

ROISDORF (Rhenish Prussia). Altitude 1000′. Table water.

*Analysis* of 16 oz. Troy = 7680 grs. :—

| | Trinkquelle. | Stahlquelle. | |
|---|---|---|---|
| Carbonate of Soda | 6·04 | 1·38 | grains. |
| Carbonate of Lime | 2·16 | 2·18 | „ |
| Chloride of Sodium | 14·60 | 3·86 | „ |
| Carbonate of Magnesia | 3·06 | 1·03 | „ |
| Carbonate of Protoxide of Iron | ·05 | ·20 | „ |
| Silica | ·12 | ·70 | „ |
| | 29·70 | 10·53 | grains. |
| Carbonic Acid | 19 c. in. | | |

Imported.

ROMAN SPA (Echzell, Ober-Hessen). An acidulated mineral water, suitable for table use.

*Fresenius's Analysis* of 16 oz. :—

| | |
|---|---|
| Chloride of Sodium | 11·606 |
| Chloride of Potassium | ·469 |
| Chloride of Calcium | 1·313 |
| Sulphate of Lime | ·962 |
| Carbonate of Lime | 5·663 |
| Carbonate of Magnesia | 10·582 |
| Carbonate of Protoxide of Iron | ·306 |
| Silicic Acid | ·614 |
| Total Solid Constituents | 31·519 |
| Carbonic Acid (free and in solution) | 21·636 |
| | 53·155 |

ROSBACH (Germany).

*Analysis* of 1 gallon = 70,000 grains:—

| | | |
|---|---|---|
| Chloride of Sodium | 83·0 | grains. |
| Carbonate of Lime | 25·7 | „ |
| Carbonate of Magnesia | 12·6 | „ |
| Imported and drunk as a table water. | 121·3 | grains. |

ROYAT (Puy-de-Dôme, France). Altitude 1380′.

These are alkaline springs, and are useful in cases of gastro-intestinal dyspepsia, rheumatism, and catarrhal affections of the genito-urinary passages.

*Analysis* of 1000 grains:—

| | Eugénie. | Cæsar. | St. Mark. | St. Victor. | |
|---|---|---|---|---|---|
| Bicarbonate of Soda | 1·349 | ·392 | ·8003 | ·8886 | grains. |
| Bicarbonate of Potash | ·435 | ·286 | ·1701 | ·8886 | „ |
| Bicarbonate of Lime | 1·000 | ·686 | ·9696 | 1·0121 | „ |
| Bicarbonate of Magnesia | ·677 | ·397 | ·6568 | ·6464 | „ |
| Bicarbonate of Iron | ·040 | ·025 | ·0230 | ·0560 | „ |
| Sulphate of Soda | ·185 | ·115 | ·1463 | ·1656 | „ |
| Phosphate of Soda | ·018 | ·014 | traces. | traces. | |
| Chloride of Sodium | 1·728 | ·766 | 1·5655 | 1·6497 | „ |
| Chloride of Lithium | | | ·0350 | ·0350 | „ |
| Silicic Acid | ·156 | ·167 | | | |
| Silica | | | ·0945 | ·0950 | „ |
| | 5·588 | 2·848 | 4·4551 | 5·4370 | grains. |
| Carbonic Acid | ·377 | 1·229 | 1·709 | 1·492 | grains. |

Imported.

RUBINAT (Pyrenees, Spain). A natural purgative water. The usual dose is from half to one wineglassful, taken in the morning fasting.

*Bouchardat's Analysis* of 16 oz.:—

| | | |
|---|---|---|
| Sulphate of Soda | 674·8707 | grains. |
| Sulphate of Potash | 1·6120 | „ |
| Sulphate of Magnesia | 22·8540 | „ |
| Sulphate of Lime | 13·6004 | „ |
| Chloride of Sodium | 14·4064 | „ |
| Silica, Alumina, and Ferric Oxide (trace) | ·2100 | „ |
| Total Solid Constituents | 727·5535 | „ |

SAINT BOÈS (Mounicq, Basses-Pyrénées, France). A natural, sulphonaphthalic, arsenical, ioduretted water, unique in chemical composition and therapeutic qualities; it is cold (temperature 54° Fahr.), limpid, strongly sulphuretted, and naphthalic. It bears transport and storage without deterioration. The St. Boès water is a powerful natural specific against the various diseases of the skin, and of the mucous membranes generally, of the bronchia, lungs, and chest. It is invaluable for the treatment of bronchitis, laryngitis, angina, phthisis, both pulmonary and laryngeal, all kinds of catarrh, asthma, chronic diseases of the stomach, dyspepsia, gastritis, gastralgia, imperfect digestion, chronic venereal diseases, tetter, eczema, etc.

SAINT-GALMIER (Loire, France). Altitude 1350′.

Useful in dyspepsia.

| *Analysis* of 1000 grains:— | “Badoit” spring. |
|---|---|
| Bicarbonate of Soda | ·560 grains. |
| Bicarbonate of Potash | ·020 ,, |
| Bicarbonate of Lime | 1·410 ,, |
| Bicarbonate of Magnesia | |
| Sulphate of Soda | ·200 ,, |
| Sulphate of Lime | |
| Silicate of Alumina | ·134 ,, |
| Chloride of Magnesium | ·480 ,, |
| | 2·834 grains. |
| Free Carbonic Acid | 1·25 volume. |

Imported.

SALINS-LES-BAINS (Jura, France). Altitude 1054′.

Season from May 15th to September 30th. The waters are used for scrofulous affections.

| *Analysis* of 16 oz.:— | |
|---|---|
| Iodide of Sodium | trace |
| Bromide of Potassium | ·2145 grains. |
| Chloride of Potassium | 1·7963 ,, |
| Chloride of Magnesium | 6·0908 ,, |
| Carbonate of Lime | trace |
| Carbonate of Magnesia | trace |
| Sulphate of Lime | 9·9166 ,, |
| Sulphate of Potash | 4·7656 ,, |
| Chloride of Sodium | 159·2160 ,, |

SANKT-MORITZ or SAINT-MAURICE (Upper Engadine, Switzerland). Altitude 5164′. Climate rough; environs romantic. Mean temperature of summer months, 51° F.

Tonic and stimulating, in debility, anæmia, neuralgia, scrofula, and in some conditions of lung disease. Used for drinking and for baths. Season, July and August.

The old spring contains in 16 oz. Troy = 7680 grs.:—

Temperature, Fahr. 42°.

| | |
|---|---|
| Carbonate of Lime | 5·5 grains. |
| Carbonate of Magnesia | 1·0 ,, |
| Carbonate of Iron | ·18 ,, |
| Carbonate of Manganese | ·03 ,, |
| Carbonate of Soda | 1·46 ,, |
| Sulphate of Soda | 2·0 ,, |
| Chloride of Sodium | ·29 ,, |
| Sulphate of Potash | ·12 ,, |
| Silica | ·29 ,, |
| Phosphoric Acid | ·03 ,, |
| Bromine, Iodine, and Fluorine | traces. |
| | 10·90 grains. |
| Carbonic Acid | 39·5 c. in. |

Imported.

The new spring contains 13½ grains of solids in 16 oz., viz.:—

More Lime and Magnesia than the old spring, 0·25 grain of Iron, and 40½ cubic inches of Carbonic Acid.

**SARATOGA** (U.S.A.). The water is alterative, contains in a degree iodides and bromides, and is useful in glandular and visceral obstructions, also in diseases of the skin. Dose, is one or two bottles daily.

*Analysis* of 16 oz. :—

Temperature 52° Fahr.

| | Congress. |
|---|---|
| Chloride of Sodium | 6·0066 grains. |
| Chloride of Potassium | ·1207 ,, |
| Bromide of Sodium | ·1282 ,, |
| Iodide of Sodium | ·0020 ,, |
| Bicarbonate of Lime | 1·4938 ,, |
| Bicarbonate of Magnesia | 1·0822 ,, |
| Bicarbonate of Soda | ·1120 ,, |
| Bicarbonate of Lithia | ·0448 ,, |
| Bicarbonate of Baryta | ·0114 ,, |
| Bicarbonate of Strontia | trace |
| Bicarbonate of Protoxide of Iron | ·0037 ,, |
| Sulphate of Potash | ·0133 ,, |
| Phosphate of Soda | ·0002 ,, |
| Silica | ·0126 ,, |
| Alumina | trace |
| Organic Matter | trace |
| Total Solid Constituents | 9·0320 ,, |

Carbonic Acid Gas (free) 52·8 cubic inches.

The "Congress" and the "A" Springs are bottled for export.

**SAUERBRUNNEN** (Goslar-am-Hartz, Germany). A natural mineral table water, with a most agreeable flavour. It stimulates the appetite and promotes digestion.

*Analysis* in grains per gallon :—

| | |
|---|---|
| Chloride of Sodium | ·20699 |
| Chloride of Potassium | ·25578 |
| Sulphate of Magnesia | ·73157 |
| Bicarbonate of Magnesia | ·92610 |
| Silica | ·62300 |
| Total Solid Constituents | 2·74344 |

**SCHINZNACH** (Switzerland). Altitude 1060′. Mountainous and picturesque. Climate mild and salubrious.

There is only one spring; it is the most sulphureous of all the Continental waters, and the most frequented. The visitors are chiefly French. The baths are cooled to 90° F.; they are used for skin diseases, diseases of the bones, and local rheumatism.

*Analysis* of 16 oz. Troy = 7680 grs. :—

Temperature, 96° F.

| | |
|---|---|
| Sulphate of Soda | 9·87 grains. |
| Sulphate of Potash | ·68 ,, |
| Sulphate of Lime | 1·20 ,, |
| Chloride of Potassium | 5·48 ,, |
| Chloride of Magnesium | 1·14 ,, |
| Magnesia | ·64 ,, |
| Carbonate of Magnesia | ·03 ,, |
| Carbonate of Lime | 1·09 ,, |
| Oxide of Iron | ·008 ,, |
| Alumina | ·07 ,, |
| Silica | ·09 ,, |
| *Gases.* | |
| Carbonic Acid | 2·38 c. in. |
| Sulphuretted Hydrogen | 1·72 ,, |
| Nitrogen | a trace. |

SCHLANGENBAD (Nassau). Altitude 933′. Mean annual temperature, 50° F Locality romantic. Air mild and bracing. Season, June, July, and August.

The baths have a sedative and a beautifying influence on the skin, rendering it soft and juvenile; highly useful in nervous irritability arising from debility.

*Fresenius's Analysis* of 16 oz. Troy = 7680 grs. :—

| | | |
|---|---|---|
| Sulphate of Potash | 0·091 | grains. |
| Chloride of Potassium | 0·004 | ,, |
| Chloride of Sodium | 1·325 | ,, |
| Phosphate of Soda | 0·004 | ,, |
| Carbonate of Potash | 0·079 | ,, |
| Carbonate of Lime | 0·250 | ,, |
| Carbonate of Magnesia | 0·047 | ,, |
| Silica | 0·258 | ,, |
| | 2·558 | grains. |
| Carbonic Acid | 0·668 | grain. |

SCHWALBACH (Nassau). Altitude 909′. Climate bracing. Mean season temperature, 64° F.

Resorted to for quiet, and recruiting dilapidated health. Season, June, July, and August.

*Fresenius's Analysis* of 16 oz. Troy = 7680 grs. :—

| Temperature, Fahr. | Stahl-brunnen. 46°—51° | Wein-brunnen. 49°—50° | Paulinen-brunnen. 48°—50° | Rosen-brunnen. | |
|---|---|---|---|---|---|
| Bicarbonate Protoxide of Iron | ·643 | ·443 | ·65 | ·91 | grain. |
| Bicarbonate Protoxide of Manganese | ·141 | ·070 | 0 | 0 | ,, |
| Bicarbonate of Soda | ·158 | 1·884 | ·45 | ·35 | ,, |
| Chloride of Sodium | ·052 | ·066 | ·03 | ·32 | ,, |
| Sulphate of Soda | ·061 | ·048 | ·02 | ·8 | ,, |
| Sulphate of Potash | ·029 | ·057 | 0 | 0 | ,, |
| Bicarbonate of Lime | 1·700 | 4·394 | 2·95 | 2·95 | ,, |
| Bicarbonate of Magnesia | 1·630 | 4·467 | 2·75 | ·98 | ,, |
| Silica | ·246 | ·357 | 0 | 0 | ,, |
| | 3·660 | 11·786 | 6·86 | 5·57 | grains. |
| *Gases.* | | | | | |
| Carbonic Acid | 50·27 | 45·6 | 39·5 | ·26 | c. in. |
| Sulphuretted Hydrogen | ·003 | ·003 | 0 | 0 | ,, |

The first two are for drinking, the last two for bathing. The Stahlbrunnen is employed for general torpidity.

Imported.

SEIDLITZ (Bohemia).

*Steinmann's Analysis* of 16 oz. Troy = 7680 grs. :—

| | | |
|---|---|---|
| Sulphate of Magnesia | 79·55 | grains. |
| Sulphate of Soda | 17·44 | ,, |
| Carbonate of Lime | 5·29 | ,, |
| Carbonate of Magnesia | ·20 | ,, |
| Carbonate of Strontia | ·009 | |
| Sulphate of Lime | 4·14 | ,, |
| Sulphate of Potash | 4·41 | ,, |
| Chloride of Magnesium | 1·06 | ,, |
| Carbonate of Protoxide of Iron and Manganese | ·05 | ,, |
| Silica | ·05 | ,, |
| Fluoride and Bromide of Magnesium | a trace. | |
| | 112·199 | grains. |

SELTERS (Nassau). Altitude 800′. Furnishes the well-known *Seltzer-water.*

*Kastner's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Temperature 62° F. | |
|---|---|---|
| Bicarbonate of Soda | 9·7741 | grains. |
| Chloride of Sodium | 17·2285 | ,, |
| Chloride of Potassium | ·2890 | ,, |
| Sulphate of Soda | ·2615 | ,, |
| Phosphate of Lime | ·0004 | ,, |
| Phosphate of Alumina | ·0002 | ,, |
| Phosphate of Soda | ·2615 | ,, |
| Fluoride of Calcium | ·0016 | ,, |
| Bicarbonate of Lime | 2·6678 | ,, |
| Bicarbonate of Magnesia | 2·5586 | ,, |
| Bicarbonate of Iron | ·1088 | ,, |
| Bicarbonate of Manganese | ·0032 | ,, |
| Bromide of Sodium | ·0002 | ,, |
| Silica | ·2500 | ,, |
| | 33·4054 | grains. |
| *Gases.* | | |
| Carbonic Acid | 30·0100 | c. in. |
| Nitrogen | ·0285 | ,, |
| Oxygen | ·0046 | ,, |
| | 30·0431 | c. in. |

Imported.

SODEN (Nassau). Altitude 437′. Locality charming; air mild; temperature steady.

There are nineteen other springs not in use. In Germany these springs have a great reputation for chest diseases, are employed in atonic gout, scrofula, and diseases peculiar to females.

Analysis of 16 oz. Troy = 7680 grs.:—

| | Milch-brunnen. | Warm-brunnen. | Wilhelms-brunnen. | Sool-brunnen. | |
|---|---|---|---|---|---|
| Temperature, Fahr. | 74° | 70° | 57° | 68° | |
| Chloride of Sodium | 17·68 | 26·13 | 104·10 | 114·40 | grains. |
| Chloride of Potassium | ·16 | 1·29 | 2·53 | 3·52 | ,, |
| Sulphate of Lime | ·19 | ·25 | ·98 | ·76 | ,, |
| Carbonate of Lime | 2·73 | 4·47 | 8·38 | 8·63 | ,, |
| Carbonate of Magnesia | 1·37 | 2·63 | 1·28 | ·29 | ,, |
| Carbonate of Iron | ·16 | ·30 | ·30 | ·60 | ,, |
| Alumina | ·01 | 0 | ·05 | ·88 | ,, |
| Silica | ·16 | ·23 | ·30 | ·50 | ,, |
| | 23·46 | 35·30 | 117·92 | 129·58 | grains. |
| Carbonic Acid | 17·0 | 35·9 | 48·9 | 14·0 | c. in. |

SPA (Belgium). Altitude 1030′. Sheltered. Air salubrious and bracing, but subject to sudden changes of temperature.

There are seven springs in all.

These chalybeates are highly beneficial in anæmia, debility, and depression of system. Season, August and September.

*Struve's Analysis* of 16 oz. Troy = 7680 grs. of Pouhon :—

| | Temperature, 52° Fahr. | |
|---|---|---|
| Carbonate of Protoxide of Iron | ·375 | grains. |
| Carbonate of Protoxide of Manganese | ·052 | ,, |
| Carbonate of Soda | ·738 | ,, |
| Carbonate of Lime | ·986 | ,, |
| Carbonate of Magnesia | 1·123 | ,, |
| Sulphate of Potash | ·079 | ,, |

| | |
|---|---|
| Sulphate of Soda | ·038 grains. |
| Chloride of Sodium | ·050 ,, |
| Phosphate of Lime | ·013 ,, |
| Phosphate of Alumina | ·009 ,, |
| Silica | ·499 ,, |
| | 3·962 grains. |
| Carbonic Acid Gas | 21·6 c. in. |

Imported.

TARASP (Switzerland). Lower Engadine. Altitude 4265′. Scenery mountainous and cultivated.

Useful in abnormal obesity, oppressed functions of the glandular and vascular system, gout, rheumatism, and skin diseases, the mountain air contributing largely to invigorate the system. Season, June to September, when the weather is genial and constant. Mean temperature of July, 51° F.

*Dr. Planta's Analysis* of 16 oz. Troy = 7680 grs.:—

| | Grosse-quelle. Temperature 37° F. | Kleine-quelle. |
|---|---|---|
| Sulphate of Soda | 16·547 grains. | 16·417 grains. |
| Carbonate of Soda | 27·229 ,, | 28·535 ,, |
| Chloride of Sodium | 29·401 ,, | 29·381 ,, |
| Carbonate of Magnesia | 5·076 ,, | 4·977 ,, |
| Carbonate of Protoxide of Iron | ·152 ,, | ·140 ,, |
| Carbonate of Lime | 12·432 ,, | 12·402 ,, |
| *Iodide of Sodium | 1·536 ,, | — |
| Sulphate of Potash | 2·998 ,, | 3·337 ,, |
| Silica | ·247 ,, | ·092 ,, |
| Alumina | ·002 ,, | — |
| Phosphoric Acid | ·002 ,, | — |
| Carbonic Acid | 34·887 ,, | 33·271 ,, |

Imported.

TAUNUS (Frankfort). Altitude 390′.

*Analysis* of 10,000 parts:—

| | |
|---|---|
| Chloride of Sodium | 25·72 |
| ,, Potassium | 2·70 |
| Carbonate of Lime | 13·70 |
| ,, Magnesia | 1·76 |
| ,, Soda | ·20 |
| Sulphate of Lime | ·58 |
| Silica | traces. |
| Alumina | traces. |
| Phosphate of Lime | traces. |
| | 54·66 |
| Carbonic Acid compressed | 28·94 |
| Carbonic Acid by estimate in solution | 17·35 |
| | 46·29 |

Imported and drunk as a table water.

TCHITLI (Turkey). Bicarbonate of Soda Spring.

Rises at 55° F., sp. g. 1005.

Contents of a litre = 35 fluid oz.

---

* Dr. Killias has corrected Planta. He says the quantity of Iodide of Sodium is only 0·0015 grain.

| | | |
|---|---|---|
| Bicarbonate of Soda | 4·554 | grammes. |
| „ „ Potash | ·148 | „ |
| „ „ Magnesia | ·365 | „ |
| „ „ Lime | ·367 | „ |
| Sulphate of Soda | ·132 | „ |
| Phosphate of Soda | ·061 | „ |
| Chloride of Sodium | ·066 | „ |
| Protoxide of Iron | ·005 | „ |
| Iodide of Sodium | a trace. | |
| Silex | ·057 | „ |
| Free Carbonic Acid | ·475 | „ |
| | 6·230 | grammes. |

Imported.

TOEPLITZ or TEPLITZ (Bohemia). Altitude 648′. Sheltered. Climate mild and salubrious. Mean annual temperature, 50° F.

There are several springs, ranging from 78° to 120° F., nine bathing establishments, and mud-baths also. The baths are best suited to nervous patients, very efficacious in chronic rheumatism, gout, paralysis, and neuralgia.

*Wolf's Analysis* of 16 oz. Troy = 7680 grs. :—

| | Haupt-quelle. Temperature, 120° F. | |
|---|---|---|
| Sulphate of Potash | 0·098 | grains. |
| Sulphate of Soda | ·290 | „ |
| Carbonate of Soda | 2·635 | „ |
| Phosphate of Soda | ·014 | „ |
| Fluoride of Silicium | ·351 | „ |
| Chloride of Sodium | ·433 | „ |
| Carbonate of Lime | ·330 | „ |
| Carbonate of Strontia | ·027 | „ |
| Carbonate of Magnesia | ·088 | „ |
| Carbonate of Protoxide of Iron | ·019 | „ |
| Carbonate of Protoxide of Manganese | ·021 | „ |
| Phosphate of Alumina | ·020 | „ |
| Silica | ·443 | „ |
| Crenic Acid | ·034 | „ |
| | 4·854 | grains. |

VALS (France). Altitude 2475′.

Beneficial in lithiasis, indigestion, syphilitic and skin diseases, and scrofula.

*M. Henri's Analysis* of 1 litre (35 fluid oz.) :—

| | Saint-Jean. | Précieuse. | Désirée. | Rigolette. | Madeleine. |
|---|---|---|---|---|---|
| Temperature | 66° F. | 66° F. | 68° F. | 68° F. | 66° F. |
| Bicarbonate of Calcium | 0·3100 | 0·630 | 0·571 | 0·259 | 0·520 |
| Bicarbonate of Magnesia | 0·1200 | 0·750 | 0·900 | | 0·672 |
| Bicarbonate of Soda | 1·4800 | 5·940 | 6·040 | 5·800 | 7·280 |
| Bicarbonate of Potash | 0·0400 | 0·230 | 0·263 | 0·265 | 0·255 |
| Bicarbonate of Protoxide of Iron with trace of Manganese | 0·0060 | 0·010 | 0·010 | 0·024 | 0·029 |
| Chloride of Sodium and Potassium | 0·0600 | 1·080 | 1·100 | 1·200 | 1·016 |
| Sulphate of Soda | 0·0540 | 0·185 | 0·200 | 0·220 | 0·235 |
| Sulphate of Calcium | 0·0700 | | | | |
| Alumina | 0·0110 | 0·060 | 0·058 | 0·060 | 0·097 |
| Bicarbonate of Lithia | traces. | traces. | traces. | traces. | traces. |
| Arseniate of Soda | | | | | |
| Alkaline Ioduret | | | | | |
| Organic Matter | | | | | |
| Grammes | 2·1510 | 8·885 | 9·142 | 7·828 | 9·104 |
| = Grains | 33 | 136 | 141 | 120 | 140 |
| Carbonic Acid Gas | 0·4250 | 2·218 | 2·145 | ·095 | 2·050 |

Saint-Jean, sedative; Désirée, Précieuse, laxative; Rigolette, Madeleine, renovating; also Dominique, tonic.

Imported.

VERNET (Eastern Pyrenees). The principal sources of the ancient Thermæ used by the Romans.

There are three springs, temperature 48° F., 91° F., and 137° F. Here Ibrahim Pasha resided. By means of pipes fed by the thermal water the apartments are kept at a comfortable warmth (54° to 59° F.) the whole of the winter (most desirable for phthisical patients), so that the waters can be taken at all seasons. Mean temperature of the atmosphere in October, 61° F.; in November, 51° F.; showing a mild and equable climate.

VICHY (Central France). Altitude 787′. Locality charming; climate very mild, hot in summer.

Useful in kidney diseases and diabetes, also in gout and hepatic derangement.

Both for drinking and bathing. Season, May to October.

*Bouquet's Analysis* of a litre (35 fluid oz.):—

| | Grande Grille. | Hôpital. | Célestins. | Hauterive. |
|---|---|---|---|---|
| Temperature | 106° F. | 86° F. | 57·6° F. | 59° F. |
| Carbonic Acid | 0·908 | 1·067 | 1·299 | 2·183 |
| Bicarbonate of Soda | 4·883 | 5·029 | 4·101 | 4·687 |
| Bicarbonate of Potash | 0·352 | 0·440 | 0·231 | 0·189 |
| Bicarbonate of Magnesia | 0·303 | 0·200 | 0·554 | 0·501 |
| Bicarbonate of Strontia | 0·003 | 0·005 | 0·005 | 0·003 |
| Bicarbonate of Lime | 0·434 | 0·570 | 0·669 | 0·432 |
| Bicarbonate of Protoxide of Iron | 0·004 | 0·004 | 0·004 | 0·017 |
| Bicarbonate of Protoxide of Manganese | trace. | trace. | trace. | trace. |
| Sulphate of Soda | 0·291 | 0·921 | 0·314 | 0·291 |
| Phosphate of Soda | 0·130 | 0·046 | trace. | 0·046 |
| Arseniate of Soda | 0·002 | 0·002 | 0·003 | 0·002 |
| Borate of Soda | trace. | trace. | trace. | trace. |
| Chloride of Sodium | 0·534 | 0·518 | 0·550 | 0·534 |
| Silica | 0·070 | 0·050 | 0·065 | 0·071 |
| Organic Matter, Bituminous | trace. | trace. | trace. | trace. |
| Grammes | 7·914 | 8·222 | 7·865 | 8·946 |
| Grains = | 122 | 126 | 121 | 138 |

Imported.

VICTORIA OFENER (*see* BUDA-PESTH).

WEILBACH (Nassau). Altitude 420′. Situated on a fertile declivity. Climate mild.

The water is generally warmed before being drunk.

Good in chest diseases, in gout, rheumatism, and herpetic affections, and in lead and mercury poisoning.

*Fresenius's Analysis* of 16 oz. Troy = 7680 grs.:—

| Sulphur Spring, Temperature 57° F. | | New Soda-Lithia, Temperature 54·5° F. | |
|---|---|---|---|
| Bicarbonate of Soda | 3·123 | . . . . . . . . . . | 7·3748 grains. |
| Bicarbonate of Lithia | ·006 | . . . . . . . . . . | ·0452 „ |
| Bicarbonate of Baryta | ·009 | Carbonate of Iron | ·0193 „ |
| Bicarbonate of Strontia | ·001 | Carbonate of Manganese | ·0039 „ |
| Chloride of Sodium | 2·083 | . . . . . . . . . . | 9·6677 „ |
| Chloride of Potassium | ·214 | Sulphate of Soda | 1·7073 „ |
| Sulphate of Potash | ·298 | . . . . . . . . . . | ·4233 „ |
| Phosphate of Alumina | ·001 | Bromide of Sodium | ·0056 „ |
| Phosphate of Lime | ·002 | Iodide of Sodium | ·0010 „ |
| Carbonate of Lime | 2·909 | . . . . . . . . . . | ·7504 „ |
| Carbonate of Magnesia | 2·758 | . . . . . . . . . . | ·5563 „ |
| Silica | ·111 | . . . . . . . . . . | ·0943 „ |
| Organic Matter | ·037 | Carbonate of Ammonia | ·0871 „ |
| *Gases.* | 11·566 | | 20·6581 „ |
| Carbonic Acid | 3·126 c. in. | Carbonic Acid | 5·9553 c. in. |
| Sulphuretted Hydrogen | ·169 „ | Sulph. Hydrogen | ·0026 „ |

Imported.

WIESBADEN (Nassau). Altitude 346′. Open to the south, with charming environs. Mean annual temperature 51° F. Season, May to September.

There are twenty-three springs; the Kochbrunnen is the principal.

Useful in chronic rheumatism and gout. The baths are allowed to cool before using them.

*Fresenius's Analysis* of 16 oz. Troy = 7680 grs.:—

Temperature, 160° F.

| | | |
|---|---|---|
| Chloride of Sodium | 52·50 | grains. |
| Chloride of Potassium | 1·12 | ,, |
| Chloride of Lithium | ·001 | ,, |
| Chloride of Ammonium | ·130 | ,, |
| Chloride of Calcium | 3·620 | ,, |
| Chloride of Magnesium | 1·570 | ,, |
| Bromide of Magnesium | ·030 | ,, |
| Sulphate of Lime | ·690 | ,, |
| Silica | ·460 | ,, |
| Carbonate of Lime | 3·210 | ,, |
| Carbonate of Magnesia | ·080 | ,, |
| Carbonate of Protoxide of Iron | ·040 | ,, |
| Carbonate of Protoxide of Manganese | ·004 | ,, |
| Phosphate of Lime | ·003 | ,, |
| Arseniate of Lime | ·001 | ,, |
| Silicate of Alumina | ·004 | ,, |
| | 63·463 | ,, |
| *Gases.* | | |
| Carbonic Acid | 16·72 | c. in. |
| Nitrogen | ·10 | ,, |

WILDBAD (Würtemberg). Altitude 1300′. Scenery wild and romantic. Season, June to September, when the weather is hot; the other months very cold.

There are about fifty warm springs.

These baths are used in chronic rheumatism and gout, and in paraplegic paralysis of the lower extremities. Plethoric habits require care in using the baths.

*Analysis* of 16 oz. Troy = 7680 grs.:—

Temperature, 96° F.

| | | |
|---|---|---|
| Chloride of Sodium | 1·82 | grains. |
| Carbonate of Soda | ·53 | ,, |
| Sulphate of Soda | ·40 | ,, |
| Sulphate of Potash | ·20 | ,, |
| Carbonate of Lime | ·34 | ,, |
| Carbonate of Magnesia | ·70 | ,, |
| Carbonate of Protoxide of Iron and Manganese | ·29 | ,, |
| Silica | ·39 | ,, |
| | 3·58 | grains. |
| *Gases.* | | |
| Carbonic Acid | | |
| Nitrogen | | |
| Oxygen | | |

[The above have been condensed from the works of Dr. Sutro, Dr. Althaus, Dr. Glover, and the various pamphlets issued at the sources of the several Spas.]

*The following are sold in bottles :—*

ADELHEIDSQUELLE (Heilbrunn, Germany). Contains a large proportion of Salts of Bromine and Iodine; acts powerfully on the glandular, lymphatic, and cutaneous systems. *Vide* analysis.

ÆSCULAP (Hungary). A recently imported water, which Professor Tichborne has compared with Hunyadi Janos, as being equally purgative, and more ant-acid, its action is gentle, and at the same time prompt and efficacious.

AIX-LA-CHAPELLE (Rhenish Prussia). For cutaneous diseases, &c.

* ALET (France). Chalybeate. Useful in cases of debility.

* ALLEVARD (Isère, France). Sulphureous. Useful in chest diseases and skin affections.

APOLLINARIS (Neuenahr). Acidulous, gaseous, and combines the properties of Seltzer and Ems (Krähnchen). Good for sickness, dyspepsia, and bad appetite. When impregnated with Carbonic Acid is drunk at meals.

* BARÉGES (France, *Hautes-Pyrénées*). Sulphureous; effective in skin diseases, scrofula, diseased bone, and ulcers. *Vide* analysis.

BETHESDA (Wisconsin, U.S.A.). A water used successfully in the treatment of diseases of the kidneys and inflammation of the bladder.

* BIRMENSDORFF (Switzerland). Alterative bitter saline, consisting chiefly of Sulphates of Lime, Magnesia, and Soda.

BONNES (France, *Basses-Pyrénées*). Sulphureous; is highly extolled for incipient consumption, scrofula, rheumatism, and as a purifier of the blood. *Vide* analysis.

BOURBOULE, LA (France, *Puy-de-Dôme*). Contains arsenic and iron. For impoverished blood, gout, &c.

BUSSANG (France, *Vosges*). Saline chalybeate; strengthens the digestive organs, acting mildly on the bowels and kidneys.

CARLSBAD (Sprudel, 165° F. Mühlbrunnen, 127° F., and Schlossbrunnen), Alkaline and gaseous; Sprudel is the favourite; drunk for bilious affections, gall stones, jaundice, gout, and gravel; are powerfully purgative. *Vide* analysis.

CARLSBAD-SALT. In bottles.

* CAUTERETS (France, *Hautes-Pyrénées*). Sulphureous; more exciting than Baréges and Bonnes; useful in skin diseases, rheumatism, and scrofula.

* CHALLES (Savoy). Sulphureous; milder in action than Baréges.

CONDAL (Pyrenees, Spain). Non-bitter aperient. For chronic indigestion, affections of the liver, and spleen.

CONTREXÉVILLE (France, *Vosges*). Alkaline, chalybeate; promotes circulation of the blood, good in chlorosis, gastralgia, etc.

EMS (Kessel and Krähnchen, Nassau). Saline, gaseous, preferred to Carlsbad in nervous irritability, good in pulmonary as well as scrofulous complaints, gout, etc. *Vide* analysis. Also EMS-SALT in bottles.

ENGHIEN (Paris, Montmorency). A valuable sulphureous water, useful in glandular affections, and as a general tonic.

FACHINGEN (Nassau). Acidulous, gaseous; a favourite beverage, acting on the kidneys and bladder, and counteracting the tendency to lithic acid. *Vide* analysis.

FRANZ JOSEF (Buda-Pesth, Hungary). Palatable aperient water, rich in Salts of Magnesium, and Sodium.

FRIEDRICHSHALL, Bitter Water (Saxe-Meiningen). Alterative, aperient; acting on the liver and pancreas; similar to Pullna. *Vide* analysis. It is very largely consumed in England, being a most valuable alterative and aperient; it is made warm and drunk in doses of half a tumblerful in the morning twice a week. The importations are frequent, as it is bottled at the Spring throughout the year except in frosty weather.

GUBER (Srebrenica, Bosnia). Contains arsenic and iron. For anæmia and chlorosis, in diseases of women and children.

HOMBURG (Central Germany). More active than Kissingen Rakoczi, and better suited to a torpid state of bowels. *Vide* analysis. Also Homburg Salt.

HUNGARIAN BITTER WATER (Royal), like Hunyadi Janos.

HUNYADI JANOS. See Buda-Pesth. Bitter aperient.

KISSINGEN (Maxbrunnen, Bavaria). Saline, gaseous; less exciting and more aperient than Carlsbad. (Rakoczi, Pandur.) Saline, gaseous; aperient, alterative, deobstruent, with a specific action on the uterine system of females. *Vide* analysis.

KISSINGEN, Bitter Water, is similar to that of Friedrichshall.

KREUZNACH (Elizabeth, Prussia). Saline; contains Iodine; alterative, tonic and renovating, useful in lymphatic and torpid habits. *Vide* analysis.
Kreuznach-Salt in bottles.

KRONDORF (Austria). Sparkling and refreshing; may be drunk *ad lib.* Aids digestion, and is diuretic.

KRONENQUELLE (Obersalzbrunn, Silesia). Sodio-lithiated saline, slightly ferruginous, with agreeable flavour. For gouty diathesis and nephritic affections.

LEVICO (Austrian Tyrol). Contains Arsenic and Iron.
For anæmia, chlorosis, &c.

LUHATSCHOWITZ (Moravia, Austria). Contains Bromide, Iodide, Chloride, and Carbonate of Sodium.

MARIENBAD (Kreuzbrunnen, Bohemia). A gaseous bitter saline, similar in properties to Carlsbad, but milder. *Vide* analysis.

NEUENAHR (on the Rhine, Apollinaris). Gaseous saline; exhilarating, diuretic, slightly acting on the liver and stomach. *Vide* analysis.

OBERBRUNNEN (Salzbrunn, Silesia). A lithiated saline, similar to "Kronenquelle," but stronger. For gouty diathesis and nephritic affections.

OFEN (Rakoczi), Kissingen.

OREZZA (Corsica). Chalybeate, with a trace of Manganese, and highly sparkling; useful in gastralgia, sluggish liver, and spleen, chlorosis, amenorrhœa, and leucorrhœa

POUGUES (France). Saline, slightly chalybeate, contains 34 grs. in 20 oz., chiefly Bicarbonates of Lime and Magnesia, with Carbonic Acid; drunk for gravel and catarrh of the bladder.

PULLNA (Bohemia). A bitter saline; mild and effective purge, acting without griping. *Vide* analysis.

PYRMONT (Westphalia). A valuable chalybeate in dyspepsia, debility from exhausting diseases, and constitutional weakness. *Vide* analysis.

* ROMAN SPA (Echzell, Ober Hessen). Acidulated, gaseous, sparkling; drunk as a table water.

ROYAT (France, *Puy-de-Dôme*). Alkaline spring, good in cases of gastro-intestinal dyspepsia, rheumatism, &c.

RUBINAT (Pyrenees, Spain). A saline purgative. Similar to "Condal."

SAINT-MORITZ (Switzerland). Tonic, and stimulating in debility.

SCHWALBACH (Weinbrunnen and Stahlbrunnen, Nassau). Chalybeate; pleasant to drink, tonic, alterative, and restorative; the Weinbrunnen preferred.

* SEIDLITZ, Bitter water (Bohemia). Purgative.

SOULTZMATT (France). Acidulated, gaseous; much used in France as a beverage.

SPA, Pouhon; Prince de Condé. Gaseous, chalybeate waters; restorative in cases of debility consequent upon disease, bodily or mental exertion, for both sexes; either of them may be used.

TARASP (Switzerland). Drunk for abnormal obesity, &c., &c.

TAUNUS. Acidulated, gaseous. Much used as a table water.

VALS (France). Strongly resembling those of Vichy, but less lowering; the principal are, Madeleine, Précieuse, and Rigolette. *Vide* analysis.

VICHY, Source de l'Etat (France). Saint-Yorre, alkaline; Parc, 71° F., alkaline; Des Dames, 61° F., chalybeate, most gaseous; Célestins, 59° F., for gravel and gout; Hauterive, 59° F., Hôpital, 87° F., for indigestion; Grande Grille, 107° F., for liver, dyspepsia, and intermittent fever, loss of appetite, congestion of liver and spleen; Lardy, chalybeate, for anæmia. *Vide* analysis.
Vichy-Salt in bottles.

* WEILBACH (Nassau). A weak sulphureous water, and largely impregnated with Carbonic Acid Gas; used in chest diseases.

WILDUNGEN (Waldeck). Alkaline, diuretic, antilithic, tonic; restorative, useful in leucorrhœa, spermatorrhœa, and, mixed with milk, for chronic bronchial affections.

WOODHALL and PURTON British waters } are also sold in bottles.
and MISSISQUOI from the United States

Those marked with an asterisk are not so frequently in demand, and should be ordered in advance.

## *The following waters are drunk at table:—*

The Imperial pint of water (20 oz.) contains of Saline Matter as follows:—

| | | | | |
|---|---|---|---|---|
| Apollinaris | (Rhenish Prussia) | 22 | grains. | Chiefly Carbonate of Soda. |
| Bellthal | (Rhenish Prussia) | 30 | ,, | Carbonates of Lime, Magnesia, & Soda. |
| Bilin | (Bohemia) | 43 | ,, | Chiefly Carbonate of Soda. |
| Birresborn | (Rhenish Prussia) | 42 | ,, | Carbonate of Soda and Chloride of Sodium. |
| Condillac | (France, Drôme) | 11 | ,, | Chiefly Bicarbonate of Lime. |
| Evian | (Switzerland) | 5 | ,, | ,, Bicarbonate of Soda. |
| Gerolstein | (Rhenish Prussia) | 16 | ,, | Carbonates of Lime, Magnesia, and Soda. |
| Giesshübler | (Bohemia) | 12 | ,, | Chiefly Carbonate of Soda. |
| Harzer | (Germany) | 11 | ,, | Carbonates of Lime and Soda, and Chloride of Sodium. |
| Johannis | ,, | 22 | ,, | do. do. |
| Krondorf | (Austria) | 21 | ,, | Carbonates of Potassium, Sodium and Lithium, and Chlorides. |
| Kronthal | (Germany) | 36 | ,, | Chloride of Sodium and Carbonate of Lime. |
| Roisdorf | (Rhenish Prussia) | 34 | ,, | Chloride of Sodium, Carbonates of Soda, Lime and Magnesia. |
| Rosbach | (Homburg) | 15 | ,, | do. do. |
| Salutaris | (England) | | | Aërated Distilled Water. |
| St. Galmier | (Badoit, France) | 30 | ,, | Chloride of Sodium, Carbonates of Soda, Lime and Magnesia. |
| Seltzer (Selters) | (Nassau) | 38 | ,, | Chloride of Sodium and Carbonate of Soda. |
| Sulis | (Bath, Somerset) | 20 | ,, | Sulphates of Lime and Soda, Chloride of Magnesium and Sodium. |
| Taunus | (Frankfort) | 30 | ,, | Carbonate of Lime and Chloride of Potassium and Sodium. |
| Wilhelmsquelle | (Nassau) | 40 | ,, | Chloride of Sodium, Carbonate of Lime. |

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### **Comparatively Pure.**

Buxton.
Clifton.
Gastein, 118°.
Malvern.
Schlangenbad, 50°.
Wildbad, 96°.
Winfred.

### Alkaline and Gaseous.

Bellthal.
Chateldon.
Condillac.
Contrexéville, 53°.
Couzan.
Desaignes (Eau de César).
Ems, 85° to 117°.
Fachingen.
Gerolstein.
Giesshübler.
Neuenahr, 70° to 102°.
Roman Spa.
Saint Galmier.
Vals.
Vichy.
Wildungen, 96°.

### Saline.

Homburg, 50° to 52°.
Kissingen, 49° to 51°.
Rosbach.
Salins-les-Bains.

### Bitter Saline.

Æsculap.
Birmenstorf.
Cheltenham.
Epsom.
Franz Josef.
Friedrichshall.
Hunyadi Janos.
Hungarian (Royal).
Kingswood.
Leamington.
Marienbad.
Ofen (Rakoczy).
Pullna.
Seidlitz.
Victoria-Ofener.

### Saline containing Bromine and Iodine.

Achselmannstein, 61°.
Adelheidsquelle, 50°.
Arnstadt.
Carlsbad, 119° (Markt-brunnen).
Durkheim.
Halle.
Ischl.
Kœnigsdorff-Jastrzemb.
Kissingen, 49° to 51°.
Krankenheil.
Kreuznach, 54·5°.
Luhatschowitz, 48·6°.
Mergentheim.
Mondorf, 77°.
Purton.
Reichenhall, 54° to 64°.
Saxon.
Tarasp, 37°.
Wiesbaden, 160°.
Woodhall.

### Saline containing Lithia.

Baden-Baden.
Bonifacius.
Buffalo Lithia.
Carlsbad, 119° (Markt-brunnen).
Franzensbad, 45°.
Kissingen, 49° to 51°.
Kronenquelle.
Royat.
Weilbach, 54°.

## COOL, AND THERMAL, UNDER 98° F.

### Sulphureous.

Allevard.
Baden, Austria, 92°.
Berka.
Bonnes, 91·5°.
Challes.
Eilsen, 59°.
Enghien.
Krankenheil.
Labassère, 54° to 57°.
Landeck, 81° to 83°.
Meinburg, 61°.
Miers.
Nenndorf, 52°.
Schinznach, 96°.
Uriage.

### Chalybeate and Gaseous.

Alet.
Alexandersbad.
Alexisbad.
Altwasser.
Auteuil.
Berka.
Bocklet, 50°.
Bussang.

### Chalybeate and Gaseous—*continued.*

Charlottenbrunn.
Driburg, 51°.
Flitwick.
Forges.
Griesbach.
Kösen, 65°
Kronthal, 61°.
Lippspringe, 70°.
Marienbad.
Meinburg.
Orezza.
Passy.
Pougues.
Pyrmont.
Recoaro.
Rippoldsau.
Saint-Maurice, 42°.
Schwalbach, 46° to 51°.
Soden, 68° to 74°.
Spa, 52°.

## HOT SPRINGS.

Wildbad, 96°.
Pfaffers, 100°.
Neuenahr, 102°.
Vichy, 106°.
Lippik, 111°.
Lucca, 116°.
Ems, 117°.
Gastein, 118°.
Bath, 118° to 120°.
Toeplitz, 120°.
Leuk, 124°.
Cauterets, 131°.
Aix-la-Chapelle, 131°.
Verney, 137°.
Ofen, 141°.
Baden-Baden, 155°.
Ischia, 158°.
Plombières, 159°.
Wiesbaden, 160°.
Carlsbad, 162°.
Borcette, 171°.

### Sulphureous.

Baréges, 111°.
Aix-les-Bains, 116°.
Aix-la-Chapelle, 131°.
Cauterets, 131°.
Borcette, 140°.
Bagnères-de-Luchon, 154°.

## WATERS FOR THE TABLE.

Apollinaris.
Bellthal.
Bilin.
Birresborn.
Condillac.
Evian.
Gerolstein.
Giesshübler.
Godesberger.
Harzer.
Johannis.
Krondorf.
Kronthal.
Reginaris.
Roisdorf.
Rosbach.
Salutaris.
St. Galmier.
Seltzer.
Sulis.
Taunus.
Wilhelmsquelle.

# SECTION A.

## THERAPEUTICAL CLASSIFICATION OF REMEDIES.

### AGENTS OF DEFINITE OPERATION.

**Alteratives.**—Medicines which gradually change and correct a morbid condition of the organs, without necessarily producing evacuations.

Those of *Antimony* are, Antimonii Oxidum, A. Sulphuratum, A. Tartaratum.

*Arsenic*—Acidum Arseniosum, Liquor Arsenicalis, Liquor Arsenici Hydrochloricus, Liquor Sodii Arseniatis.

*Chlorine*—Acidum Nitro-hydrochloricum Dil., Ammon. Chloridum, Calx Chlorinata, Chlori Liquor, Potassii Chloras, Liquor Sodæ Chlorinatæ, Sodii Chloridum.

*Iodine and the Iodides.*

*Mercury*—Hydrarg. c. Cretâ, Pilula Hydrarg., Hydrarg. Perchloridum and Subchloridum, Hydrarg. Iodidum.

*Phosphorus and the Hypophosphites.*

*Potassium Salts.*

*Sulphur*—Præcipitatum, Sublimatum, and Sulphides.

*Vegetable*—Dulcamara, Guaiacum, Hemidesmus (renal), Mezereum, Sarsaparilla, Taraxacum.

*Eclectics*—Corydalin, syphilitic; Iridin, renal; Leptandrin, hepatic; Phytolaccin, scorbutic; Podophyllin, Rumicin, Sanguinarin.

*Mineral Waters*—Adelheidsquelle, Carlsbad, Ems, Friedrichshall.

**Anæsthetics.**—Substances which suspend consciousness or cause insensibility to pain. They are divided into *General* (by inhalation) and *Local* (by spray or other application to the part). *General Anæsthetics:* Æther, Æther Methylatus (sp. g. ·717), Æthyl Bromidum, A.C.E. Mixture, Chloroform, Carbon Tetrachloride, Methylene, Nitrous Oxide Gas, Regnauld's Anæsthetic Mixture. *Local Anæsthetics:* Acid. Carbolic., Æther (spray), Æther Methylatus (sp. g. ·717), Æther Methylicus, Æthyl Bromidum, Antipyrin, Cocainæ Hydrochloras, Erythrophlæinæ Hydrochloras, Iodoformum, Menthol, Methyl Chloridum.

**Anodynes.**—Medicines which alleviate pain by lessening the excitability of nerves or nerve centres: Aconitum, Aconitina, Amyl Nitris, Antifebrin, Antipyrin, Atropina, Belladonna, Bromides, Brucine, Butyl-Chloral Hydras, Caffeina, Cajuputi Ol., Camphor, Cannabis Indica, Chloral Hydras, Chloroform, Cimicifuga, Codeina, Condurango, Conina, Conium, Exalgine, Gelsemium, Lupulus, Hyoscyamus, Morphina, Opium, Phenacetin, Piscidia, Scopola, Solanine, Spiritus Ætheris, Stramonium, Veratrina.

**Antacids.**—Agents which correct acidity of the secretions: Ammonia, Amm. Acet. Liquor, Ammon. Spirit. Aromatic., A. Carbonas, Bismuthi Trochisci, Calcis Liquor, C. Carbonas, C. Saccharatus Liquor, Creta Præparata, Decoct. Aloes Comp., Lithiæ Aq. Efferv., L. Carbonas, L. Citras, Magnesia, M. Carbonas, Potassæ Liquor, P. Bicarbonas, P. Carbonas, Sapo Durus, Sodii Bicarbonas, Sodæ Liquor, Sodæ Liquor Efferv., Sodii Carb.

*Mineral Waters*—Contrexeville, Ems, Fachingen, Tarasp, Vichy.

**Antalkalines.**—Medicines which neutralise excess of alkaline matter in the alimentary canal and urinary organs: Acid. Benzoic., A. Hydrochlor. Dil., A. Nit. Dil., A. Phosphoric. Dilut., A. Sulphuric. Dilut., Ammon. Benz., Potass. Benz., Sodii Benz.

**Anti-Anæmics.**—*See* Tonics, Blood.

**Antemetics.**—*See* Sedatives, Stomachic.

**Antaphrodisiacs.**—Medicines which diminish the sexual passion: Ammonii

Bromidum, Camphora, Conium, Digitalis, Lupulinum, Potassii Bromidum, Potassii Iodidum, Sodii Bromidum, Sodii Iodidum.

**Anthelmintics.**—Medicines which destroy worms (Vermicides), or expel them from the alimentary canal (Vermifuges).

**Vermicides:** *Ascarides or Thread Worms*—Acid. Carbolic., Enemata Aceti, Aloes, Ferri Perchloridi, F. Sulphatis, Quassiæ, Sennæ, Sodii Chloridi, Ol. Ricini and Terebinthinæ, Santoninum.

*Round Worm*—Santoninum.

*Tape Worm*—Cusso, Embelia Ribes, Ammonii Embelas, Extractum Filicis Liquidum, Granati Rad. Cort. Dec., Pelletierinæ Sulphas and Tannas, Kamala, Terebinthinæ Oleum.

**Vermifuges:** Areca (for Round and Tape Worms), Calomel, Cambogia, Jalapa, Ricini Oleum, Scammonium.

**Anthidrotics.**—Medicines which check perspiration: Acid. Acetic., A. Salicylic, A. Sulphuric. Dilut., A. Tannic., Agaricus, Atropina, Belladonna, Ferri Sulphas, Ferri Mist. Comp., Hæmatoxyli Decoct., Hyoscyamus, Picrotoxinum, Quinina, Scopola, Strychnina, Zinci Oxidum.

**Antidotes** are placed under the several powerful drugs.

**Antilithics.**—Medicines which counteract a tendency to the formation of Calculi, or deposition of urinary sediments: Acid. Benzoic, Acid. Nitric. Dil., Acid. Phosph. Dil., Ammon. Benz., Lithiæ Liq. Efferv., Lithii Carb., Lithii Citras, Magnes. Liq. Efferv., Potassii Acetas, Potassii Bicarb., Potassii Carb., Potassæ Liq. Efferv., Potassæ Liquor, Sapo, Sodii Benzoas, Sodii Carb., Sodii Bicarb., Sodæ Liq. Efferv., Sodii Citro-tart. Efferv.

*Mineral Waters*—Mergentheim, Neuenahr, Selters, Tchitli, Vals, Vichy, Wildungen.

**Antiparasitics.**—Medicines which destroy vegetable and animal parasites: Acid. Sulphurosum, Cupri Oleas, Hydr. Ammoniatum, Iodi Pigmentum, Olea Expressa et Essent., Naphthalene, Pyrethrum Roseum, Quassia, Sodii Hyposulphis, Sozoiodol, Staphisagria, Sulphur, Tabacum.

**Antiperiodics.**—Medicines which have the property of interrupting periodical attacks of disease: Acid. Arsenios., Beberinæ Sulph., Berberis, Cinchonæ Extr. Liquid., Nectandræ Cort., Quinine Salts, Salicin, Sodii Chloridum.

**Antipyretics.**—Medicines which reduce the temperature in fever: Absinthium, Acid. Salicylic, Aconitum, Antifebrin, Antimon. Tart., Antipyrin, Chinolin, C. Tartras, Chloral Hydras, Exalgine, Kairine, Phenacetin, Physalis, Potassii Citras, Pyrodin, Quebracho, Quinina, Resorcin, Salicin, Salol, Spirit. Æther. Muriaticus, Thallinæ Sulphas.

**Antiseptics.**—Agents which prevent the decomposition of organic structures: Acid. Benzoic, Acidum Boric., Acid. Carbolicum, A. Chromicum, A. Cresylic, A. Hydrochloricum, A. Nitric., A. Pyrogallic, A. Pyroligneosum Crudum, A. Salicylic., A. Sulphurosum, A. Trichloracetic, Aluminii Acetatis Liquor, Alum. Aceto-Tartras, Alum. Chloridi Liquor, Alum. Oleatum, Ammon. Carb., Antifebrin, Antipyrin, Borax, Boro-Glyceride, Calx Chlorinata, Carbo Ligni, Carbonei Bisulphidum, Cerevisiæ Ferment., Chinolin, C. Tartras, Chlori Liquor, Chloroformum, Creasotum, Cupri Oleas, Eucalyptol, Glycerinum, Helenine, Hydrargyri Cyanidum, Hydrargyri Zinco-Cyanidum, Hydrargyri Perchloridum, Hydrargyri et Potassii Iodidum, Iodoformum, Iodol, Iodum, Menthol, Naphthalene, Naphthol, Potassa Sulphurata, Potass. Permanganas, Resorcin, Sal-Alembroth, Salolum, Sodæ Chlorinatæ Liquor, Sodii Benzoas, Sodii Chloridum, Sodii Sulphis, Sodii Sulphocarbolas, Sozoiodol, Terebinthinæ Oleum, Thallinæ Sulph., Thymol, Tribromphenol, Trichlorphenol, Zinci Chloridum, Zinci Sulphocarbolas.

**Antispasmodics.**—Medicines which allay or prevent the recurrence of spasms: Acid. Hydrocyanic. Dil., Æther, Ammonia, A. Carbonas, A. Spiritus Aromaticus, Ammoniacum, Amyl Nitris, Argenti Nitras, Asafœtida, Belladonna, Bromides, Cajuput. Ol., Calendula, Camphora, Camphora Monobromata, Cannabis Indica, Castoreum, Cerii Oxalas, Chloral Hydras, Chloroformum, Cimicifuga, Conium, Euphorbia Pilulifera, Galbanum, Grindelia, Hyoscyamus, Lobelia, Moschus, Menth. Pip. Ol., Pil. Aloes et Asafœtidæ, Nitroglycerinum, Quebracho, Ruta, Spir. Ammon. Fœtid., Stramonium, Sumbul, Tabacum, Terebinthina, Valeriana and Valerianates, Zinci Oxidum, Zinci Sulphas, Zinci Valerianas.

**Aperients.**—*See* Cathartics.

**Aphrodisiacs.**—Medicines which excite sexual appetite: Belladonna, Cantharis, Damiana, Tinct. Ferri Perchlor., Nux Vomica (Strychnina), Phosphorus.

**Aromatics.**—*See* Carminatives.

**Astringents.**—Medicines which produce contraction of the tissues and coagulation of the albuminous fluids; they are given to improve digestion and check increased secretions, mucous discharges, and hæmorrhages; or applied topically to obviate relaxation and to stop bleeding.

*Mineral Substances.*—All the Diluted Mineral Acids, Aluminium Salts, Argenti Nitras, A. Oxidum, Borax, Cadmii Sulphas, Calamina, Calcii Carbonas, Carbolic Acid, Creasotum, Creta Præp., Cupri Sulphas, Ferri Perchlor. Liquor, F. Pernit. Liquor, F. Sulphas, Ferri et Quin. Cit., Plumbi Acetas, P. Carbonas, P. Oxidum, P. Subacetatis Liquor, Zinci Acetas, Z. Carbonas, Z. Chloridum, Z. Oxidum, Z. Sulphas, Z. Sulphocarbolas.

*Vegetable Substances.*—Acetum, Acid. Acetic. Dil., A. Gallic., A. Tannic., Bela, Catechu, Cinchona, Cinnamom, Cornin, Ergota, Erigerontis Oleum, Filix Mas, Galla, Geranin, Granati Rad. Cort., Guarana, Gummi Rubr., Hæmatoxylum, Hamamelis, Hydrastis, Krameria, Kino, Larix, Matico, Quercus, Rheum, Rosa, Rumicin, Symphytum, Terebinthinæ Ol., Ulmus, Uva Ursi, Vinca Major.

**Carminatives.**—Medicines which stimulate or aid the removal of flatus from the stomach and intestines, and relieve griping: Æther Aceticus, Anethi Ol., Anisi Ol., Camphor, Carbo Ligni, Cardamomum, Carui, Caryoph., Cinnamom, Coriander, Fœniculum, Juniper, Lavand. Ol., Limon. Ol., Menth. Pip. Ol., Myristica, Piper, Zingiber.

**Cathartics.**—Medicines which promote intestinal evacuations.

*Mild or Laxative.*—Belladonna, Cassiæ Pulpa, Euonymin, Fel Bovinum, Ficus, Glycyrrh. Pulv. Comp., Ipecac., Magnesia, M. Carbonas, M. Citratis Liquor, Manna, Mel, Menyanthes, Mori Succus, Nux Vomica, Olivæ Oleum, Potassii Sulphas, P. Tartras, Prunum, Rhamnus Frangula, R. Purshian., Ricini Oleum, Sapo, Sodii Citro-Tartras Effervescens, Sodii Phosphas, Sodii Sulphas, Soda Tartarata, Sulphur, Sulphur Præcip., Tamarindus, Taraxacum, Theriaca.

*Actively Aperient.*—Aloes Barb., A. Socot., Baptisin, Colchicum, Helleborus Niger, Iridin, Kamala, Leptandrin, Magnes. Sulphas, Podophyllin, Rheum, Senna, Sodii Sulphas.

*Drastic or Hydragogue.*—Bryonia, Cambogia, Colocynthis, Crotonis Oleum, Elaterium, Helleborus Niger, Hydrarg. Subchloridum, Jalapa, Potass. Tart. Acida, Scammonium.

*Mineral Waters.*—Achselmannstein, Birmenstorf, Carlsbad, Friedrichshall, Homburg, Hunyadi Janos, Kissingen, Marienbad, Pullna, Royal Hungarian Bitter Water (Buda-Pesth), Seidlitz.

**Caustics.**—Substances which destroy the vitality of the parts to which they are applied: Acid. Acetic. Glaciale, A. Arseniosum, A. Carbolicum, A. Chromicum, A. Nitricum, A. Sulphurici Pasta, Alum. Exsiccatum, Antim. Chlor., Argenti Nitras, Calx, Creasotum, Cupri Acetas, C. Subacetas, C. Nitras, C. Sulphas, Hydr. Iod. Rubr., Hyd. Ox. Rubr., H. Perchloridum, Hydr. Nitrat.

Acidus Liquor, Iodi Lin., Potassa Caustica, Potassa c. Calce, Potassii Permang., Soda Caustica, Sodii Ethylatis Liquor, Zinci Chloridum, Z. Nitras.

**Cholagogues.**—Agents which cause a flow of bile into the intestines: Aloes, Ammonii Chloridum, Euonymus, Hydrarg. Pil., Hyd. cum Cret., Hydrarg. Subchlor., Hydrarg. Perchloridum, Hydrastis, Ipecacuanha, Phytolaccin, Podophyllin.

*Mineral Waters.*—Ems, Friedrichshall, Hungarian, Hunyadi Janos, Kissingen.

**Demulcents.**—Substances which soften and allay irritation of mucous membranes: Acaciæ Gum., Althæa, Amygdala Dulc., Amylum, Cetaceum, Cetraria, Carrageen, Cydonii Semen, Ficus, Glycerinum, Glycyrrhiza, Hordeum, Ichthyocolla, Lini Oleum, Maranta, Mel, Morrhuæ Oleum, Olivæ Oleum, Ovi Albumen, Salep, Sevum, Theriaca, Tragacantha, Triticum Repens, Ulmi Cortex, Uvæ.

**Deodorisers.**—Substances which destroy offensive odours: Chlorine and its oxides, Acid. Sulphuros., Acid. Nitric, Carbo, Calx, Eucalypti Ol., Ferri Oxid., Ferri Sulph., Hydrogenii Peroxidum, Iodol, Plumbi Nitras, Potass. Permang., Thymol, Trichlorphenol, Zinci Chloridum.

**Desiccants.**—Agents which check secretion, and dry up mucous discharges from ulcers and wounds: Bismuth. Subnit., Calcii Carbonas, Calcii Hydras, Creta Præparata, Magnesii Carbonas, Plumbi Acetas, P. Carbonas, Talc., Zinci Oxidum.

**Diaphoretics.**—Medicines which increase the action of the skin and produce sweating. Employed in fresh colds, in fevers, dropsy, and some skin diseases: Æther, Alcohol, Ammonii Acetatis Liquor, Ammon. Carbonas, Ammon. Chlorid., Ammon. Phosphas, Antimonialis Pulvis, Antim. Tartar. Vinum, Antim. Sulphurat., Armoracia, Buchu, Cajuputi Sp., Calendula, Camphor, Chloroform, Colchici Vin., Doveri Pulv., Dulcamara, Grindelia, Guaiaci Ammon. Tinct., Ipecac. Pulv., Ipecac. Vin., Jaborandi, Lactuca, Lobelia, Morphina, Opium, Pilocarpina, Potassii Citras, Potass. Nitras, Sabina, Sassafras, Senega, Simaruba, Serpentaria, Sp. Ætheris, Nit. Sulphur, Spir. Camphoræ, Terebinthinæ Oleum.

**Disinfectants.**—Substances which act on the specific poisons of communicable diseases so as to prevent their spreading: Acid. Carbol., Acid. Nitrosum, Acid. Sulphurosum, Aluminii Chloridi Liquor, Calx Chlorinata, Chlorine, Iodoformum, Iodol, Iodum, Naphthol, Potassii Permang., Condy's Fluid, Potassii Bichrom., Ferri Sulphas, Hydrogenii Peroxidum, Sodæ Chlorinatæ Liquor, Thymol, Zinci Chloridum (Burnett's Solution).

**Diuretics.**—Medicines which promote the secretion of urine: Acid Benzoic, Alcohol, Ammon. Acet. Liq., Ammon. Benzoas, Ammon. Chlorid., Apocynum, Armoracia, Borax, Buchu, Caffeina, Cantharis, Caulophyllin, Colchicum, Convallaria, Copaiba, Copaibæ Resin., Cubeba, Damiana, Digitalis Inf., Dulcamara, Erigerontis Ol., Euonymin, Hemidesmi Radix, Iridin, Juniperi Oleum, Lactuca, Lithiæ Efferv. Liquor, Paraldehyde, Pix Liquida, Potassæ Efferv. Liq., Pareiræ Decoct., Physalis, Potassii Acetas, Potassii Nitras, Potassii Tartras Acida, Potassii Tartras, Potassii Bicarb., Potassii Carb., Potassii Chloras, Potassii Citras, Potassii Nitras, Potassæ Liquor, Senegæ Inf., Senecionin, Scoparius, Scilla, Simaruba, Sodii Bicarb., Sodii Phosphas, Sparteina, Spirit. Ætheris Nit., Tabaci Folia, Terebinthinæ Ol., Ulexine, Ulmi Decoctum, Uva Ursi.

*Mineral Waters.*—Friedrichshall, Kissingen, Leuk, Shap.

**Ecbolics.**—Substances which promote the contraction of the uterus and facilitate the expulsion of the contents: Borax, Cimicifuga, Digitalis, Ergota, Hydrastinæ Hydrochloras, Sabina.

**Emetics.**—Medicines which excite vomiting: Alum (in repeated doses), Anthemis, Antimonium Tartaratum, Apomorphinæ Hydrochloras, Baptisin, Cupri Sulphas, Ipecacuanha, Sinapis Pulvis, Sodii Chloridum, Tabacum, Veratrum Viride, Zinci Acetas, Zinci Sulphas.

**Emmenagogues.**—Medicines which maintain or restore a healthy condition of the menstrual discharge, and increase the quantity: Aloes Decoctum Co., Aloes et Myrrhæ Pil., Ammonii Chloridum, Apiol, Borax, Calendula, Cimicifuga, Ergota, Ferrum Redactum, Gossypii Tinctura, Helleborus Niger, Manganesii Oxid. Præp., Potass. Permang., Quinina, Ruta, Sabina, Senecionin, Senega.

**Emollients.**—Substances which soften and relax the tissues, also such as protect sensitive surfaces; employed to allay irritation: Adeps, Amygdalæ Oleum, Cera Alba, Cetaceum, Collodium, Cydonium, Glycerinum, Glycer. Amyli, Lini Farina, Olivæ Oleum, Sevum.

**Escharotics.**—*See* Caustics.

**Expectorants.**—Medicines which promote the secretion of bronchial mucus: Acid. Benzoicum, Æther, Ammonia, Ammonii Benz., Ammonii Carb., Ammonii Chloridum, Ammoniacum, Anisi Oleum, Antimonium Tartaratum, Apomorphinæ Hydrochlor., Asafœtida, Bals. Peruv., Bals. Tolut., Benzoin, Copaiba, Cubeba, Euonymin, Galbanum, Ipecacuanha, Laricis Cortex, Lobelia, Myrrha, Pix Liquida, Quillaia, Scilla, Senega, Styrax Præp., Tabacum, Vapores Acidi Carbolici, Chlori, Creasoti, and Iodi.

**Febrifuges.**—*See* Antipyretics.

**Hæmatinics.**—*See* Tonics, Blood.

**Hæmostatics.**—*See* Styptics.

**Hypnotics.**—(Soporifics)—Medicines which induce sleep: Amyl Nitris, Boldo, Butyl-chloral, Camphora Monobromata, Cannabis Ind., Chloral, Chloralamid, Chloroformum, Codeina, Conium, Creasotum, Hyoscyamus, Hyoscina, Hypnone, Lupulus, Methylal, Morphina, Morphinæ Bimeconatis Liquor, Narceina, Opium, Papaver, Paraldehyde, Piscidia, Potassii Bromidum, Sodii Bromidum, Sulphonal, Somnal, Urethane, Stramonium.

**Irritants.**—Substances which stimulate and cause irritation or inflammation of the parts to which they are applied; they differ in their intensity of action and may be divided as follows:—

> **Rubefacients.**—Agents which, when applied to the skin, produce local warmth and redness: Æther, Alcohol, Ammoniæ Liquor, Emp. Calefaciens, Emp. Picis, Lin. Camphoræ Co., Lin. Capsici, Lin. Chloroformi, Lin. Iodi, Lin. Sinapis Co., Mezereum, Ol. Cajuputi, Oleum Limonis, Ol. Rosmarini, Ol. Rutæ, Ol. Succini, Ol. Terebinth., Ung. Elemi.
>
> **Vesicants.**—Those which raise a vesicle or blister: Acidum Aceticum Glaciale, Ammoniæ Liquor Fortior, Cantharis.
>
> **Pustulants.**—Those which produce a pustule: Antimonium Tartaratum, Argenti Nitras, Crotonis Oleum.

**Laxatives.**—*See* Cathartics.

**Mydriatics.**—Drugs which produce dilatation of the pupil of the eye: Atropina, Belladonna, Daturina, Duboisinæ Sulphas, Homatropina, Homatropinæ Hydrobromas, Hyoscyamus, Scopola.

**Myositics.**—Drugs which contract the pupil; Physostigmina, Pilocarpina.

**Narcotics.**—*See* Hypnotics.

**Nutritives.**—Substances which quicken assimilation and improve the condition of the living tissues: Acaciæ Gum., Amygdala Dulc., Bynes Extractum, Carnis Extract., Carrageen, Cetrariæ Decoctum, Ficus, Glycerinum

Lac, Manna, Maranta, Morrhuæ Ol., Olivæ Oleum, Ovi Vitellus, Prunum, Sacch. Lactis, Salep, Sevum, Sp. Vini Gallici Mist., Theriaca, Uvæ.

**Purgatives.**—*See* Cathartics.

**Refrigerants.**—Medicines which diminish the body-heat and quench thirst: Aqua, Acidum Aceticum, A. Citricum, A. Hydrochlor. Dil., A. Nitric Dil., A. Phosph. Dil., A. Tartaricum, A. Sulph. Dil., Ammon. Acet. Liquor, Aurantii Succus, Limonis Succus, Magnesii Citratis Liquor, Mori Syrup., Oxymel, Potassii Citras, Potass. Chloras, Potass. Nitras, Potass. Tart. Acida, Prunum, Sp. Æther. Nitr., Sp. Æther. Muriaticus, Tamarindus.

**Sedatives.**—Medicines which exert a soothing influence upon the system, by diminishing pain, lessening functional activity, or tranquillising disordered muscular movement:

*Local.*—Acid. Carbol., Acid. Hydrocyan., Atropina, Belladonna, Borax, Chloral, Creasotum, Morphina, Opium, Plumbi Acetas, P. Subacetatis Liquor. *See also* Anæsthetics, Local, *and* Anodynes.

*Pulmonary.*—Acid. Hydrocyanic., Ammon. Bromid., Belladonna, Cerii Oxalas, Conium, Gelsemium, Laurocerasi Aqua, Lobelia, Morphina, Opium, Prunus Virginiana, Stramonium.

*Spinal.*—Ammonii Bromidum, Camphora Monobromata, Gelsemium, Magnesii Bromidi Liquor, Niccoli Bromidum, Physostigma, Potassii Nitras, Potassii Bromidum, Sodii Bromidum, Veratrum Viride, Viburnum, Zinci Bromidum.

*Stomachic.*—Acid. Arseniosum, Acid. Carbolic., Acid. Hydrocyan., Acid. Phosph. Dil., Alcohol Methylicum, Argenti Nitras, Belladonna, Bismuth Salts, Calcis Liquor, Cerii Oxalas, Chloral, Chloroform, Cocainæ Hydrochlor., Creasotum, Hydrarg. c. Creta, Hyoscyamus, Opium, Potass. Bicarb., Potass. Liquor Effervescens, Sodii Bicarb., Sodii Liquor Effervescens, Sodii Bromidum, Zinci Oxidum.

*Vascular.*—Acidum Hydrocyanicum, Aconitum, Amyl Nitris, Antim. Tart., Apocynum, Aqua Laurocerasi, Colchicum, Digitalis, Ergota, Ipecacuanha, Nitroglycerinum, Plumbi Acetas, Potass. Nitras, Sodii Nitris, Spirit. Æther. Nit., Tabacum, Veratrum Viride.

**Sialagogues.**—Medicines that increase the secretion of the saliva: Æther, Armoracia, Hydrargyrum and its salts, Iodides, Jaborandi, Mezereum, Physostigma, Pilocarpina, Piper, Pyrethrum, Rheum, Sinapis, Tabacum, Zingiber.

**Soporifics.**—*See* Hypnotics.

**Sternutatories.**—Medicines which increase the nasal mucous secretion, which is sometimes accompanied by sneezing: Ipecacuanha (powdered), Tabacum (snuff), Veratrum Viride (powdered).

**Stimulants.**—Medicines which increase the natural function of a part, or which cause a slight degree of superficial irritation.

*General.*—Æther, Alcohol (in small doses), Ammonia, Arnica, Cajuputi Oleum, Phosphorus.

*Spinal.*—Acid. Benzoic., Æther, Arnica, Ammon. Carb., Belladonna, Cannabis Ind., Cantharis, Ergota, Morphina, Nux Vomica, Oleum Cajuputi, Opium, Phosphorus, Strychnina, Thebaia.

*Stomachic.*—*See* Carminatives.

*Vascular.*—Æther, Alcohol, Ammonia, Ammoniacum, Castoreum, Galbanum, Guaiacum, Mezereum, Sassafras, Sumbul, Terebinthinæ Oleum, Valeriana.

*Local.*—*See* Irritants.

*Mineral Waters.*—Alexandersbad, Barèges, Cauterets, Kreuznach, St. Moritz.

**Stomachics.**—Medicines which directly promote the functions of the stomach and improve the appetite and digestion, *see* Carminatives *and* Tonics, Stomachic.

**Styptics.**—Remedies which arrest bleeding: Acetum, Acid. Gallicum, Acid. Sulphuric. Dil., Acid. Tannic., Alumen, Benzoin, Bryonia, Catechu, Cinchona Pulvis, Collodium, Creasote, Cupri Sulphas, Ergota, Erigerontis Oleum, Ferri Perchlor. Liquor and Tinct., Ferri Persulph. Liquor, Gallæ, Granati Rad. Cort., Gummi Rubri Extractum Liquidum, Hamamelis, Hydrastis, Kino, Krameria, Matico, Quercus, Plumbi Acetas, Plumbi Subacetatis Liquor, Spiritus Rectificatus, Zinci Acetas, Zinci Sulph.

**Sudorifics.**—*See* Diaphoretics.

**Tonics.**—Therapeutic agents which impart strength or tone to the body or its parts.

*Acting through the blood, and improving its quality.*—Ferri Acetatis Liquor, F. Albuminas, F. Bromidum, F. Carb. Saccharata, F. Ammonii Citras, F. Quininæ et Citras, F. Chloroxydum, F. Iodidum. F. Liquor Dialysat., F. Lactas, F. Oxid. Magnet., F. Perchlor., F. Pernit. Liquor, F. Phosphas, F. Phosph. Co. Syrup. (Squire), F. Redactum, F. Sulphas, F. Tartaratum, Easton's Syrup, Morrhuæ Oleum, Potass. Permang., Sarsæ Radix.

*Nervine.*—Acid. Arseniosum, Argenti Nitras, Argenti Oxidum, Cerii Oxalas, Cinchona, Coca, Cupri Sulphas, Damiana, Ferrum Salts, Nux Vomica, Phosphorus, Sodii Hypophosphis, Strychnina, Zinci Acetas, Zinci Oxidum, Zinci Sulph.

*Stomachic and Intestinal.*—Absinthium, Acid. Hydrochlor. Dil., A. Nitric. Dil., A. Nitro-hydrochlor. Dil., A. Phosph. Dil., A. Sulph. Dil., Anthemis, Aurant. Cort., Balsam. Peruvian., Beberinæ Sulphas, Buchu, Calumba, Canellæ Cortex, Cascarilla, Chiretta, Cinchona, Cinchonidina, Cinchonina, Cusparia, Decoct. Aloes Comp., Gentiana, Guarana, Hydrastis, Limonis Cortex, Lupulus, Menyanthes, Nectandra, Nux Vomica, Pancreatic Enzymes, Pepsin, Peptonised Foods, Pareira, Quassia, Quininæ Sulph., Rheum, Salicin, Serpentaria, Simaruba, Strychnina.

*Vascular.*—Adonis, Apocynum, Caffeina, Convallaria, Digitalis, Erythrophlæum, Ferrum Salts, Nux Vomica, Scilla, Sparteina, Strophanthus, Strychnina, Veratrum Viride.

*Mineral Waters.*—Adelheidsquelle, Alet, Altwasser, Auteuil, Berka, Bocklet, Gastein, Kreuznach, Meinberg, Orezza, Ottilienquelle, Pyrmont, St. Moritz, Spa, Schwalbach, Wildungen.

**Eclectic Tonics.**—Cornin (stimulant astringent), Hydrastin and Menispermin (dyspeptic), Cimicifugin and Scutellarin (Nervine sedative).

**Vermicides and Vermifuges.**—*See* Anthelmintics.

**Vesicants.**—*See* Irritants.

# SECTION B.

## REMEDIES EMPLOYED IN SPECIAL AILMENTS.

*Abscess, Acute. Internally:* Aconite, Belladonna, Sulphides. *Locally:* Glycerinum Belladonnæ, Iodoformum, Iodum, Acid Boric., A. Carbolicum, Pot. Permang., &c.

—— *Chronic. Internally:* Potassii Iodidum. *Locally:* Hydrargyri Oleatum c. Morphina.

*Acne. Internally:* Liquor Arsenicalis, Vinum Ferri, Confect. Sulphur. *Locally:* Ung. Sulphuris Hypochlor., Ung. Sulphuris Iodidi, Hydrarg. Perchlor. (lotion), Ichthyol, Potassa Sulphurata, Lotio Zinci Oxidi, Belladonna.

*Ague.*—See *Fever, Intermittent.*

*Albuminoid Degeneration.* Ammon. Chlorid., Ferrum Salts, Morrhuæ Ol., Pot. Bicarb., Pot. Citras.

*Albuminuria.* Acid. Gallicum, Amyl Nitris, Digitalis, Ergota, Ferri Perchlor. Tinct., Nitroglycerine.

*Alcoholism.* Absinthium, Ammoniæ Acetat. Liquor, Ammon. Carb., Armoracia, Arsenic, Calumba, Capsicum, Cimicifuga, Cocainæ Hydrochlor., Gentiana, Lupulus, Nux Vomica, Opium, Quinina, Strychnina. See also *Delirium Tremens.*

**Alteratives.**—Section A.

*Amenorrhœa.* Aconite, Aloes, Auri et Sodii Chloridum, Ergota, Ferri Bromidi Syrupus, Ferri Carb. Sacch., Ferri Lactas, Ferri Phosphas, Ferrum Redactum, Mistura Ferri Co., Menyanthes, Myrrha, Potass. Permang., Apiol Capsules, Rutæ Oleum, Santoninum.

*Anæmia.*—See *Tonics, Blood,* Section A.

—— *Pernicious.* Acid. Arseniosum.

**Anæsthetics.**—Section A.

*Anasarca.*—See *Dropsy.*

*Aneurism.* Potassii Iodidum, Potassii Nitras.

*Angina Pectoris.* Æther, Amyl Nitris, Argenti Nitras, Acid. Arseniosum, Acid. Hydrocyanic., Belladonna, Morphina (hypoderm.), Nitroglycerine, Pyridin, Sodii Nitris Purus, Zinc. Sulph.

**Anodynes.**—Section A.

**Antacids.**—Section A.

**Antalkalines.**—Section A.

**Antemetics.**—Section A.

**Anthelmintics.**—Section A

**Anthidrotics.**—Section A.

*Anthrax.* Acid. Carbolic. (injection), Chloride of Zinc Points. Ipecacuanha (internally and locally).

**Anti-Anæmics.**—Section A.

**Antidotes.**—Section A.

**Antilithics**—Section A.

**Antiparasitics.**—Section A.

**Antiperiodics.**—Section A.

**Antipyretics.**—Section A.

**Antiseptics.**—Section A.

**Antispasmodics.**—Section A.

**Aperients.**—Section A.

**Aphrodisiacs.**—Section A.

*Aphthæ.* Alum (pulv.), Argenti Nitras, Glycerinum or Mel Boracis, Confect. Rosæ Gall., Myrrha, Potass. Chloras, Sodii Sulphis.

*Apoplexy.* Aloes, Croton. Ol., Terebinth. Enema, Hydrarg. Subchlor.

**Aromatics.**—Section A.

*Ascarides.*—See *Anthelmintics.*

*Ascites.*—See *Dropsy.*

*Asthma.* Acidum Arseniosum, Acid. Hydrocyanicum Dilutum, Aconitum, Æthyl Iodidum, Ammon. Fœtid. Spirit., Ammoniacum, Amyl Nitris, Belladonna, Butyl-Chloral Hydras, Camphor, Cannabis Indic., Chloral, Chloroformum, Charta Nitrata, Balsam. Peruvianum, Eucalypti Oleum, Euphorbia Pilulifera, Grindelia Robusta, Hyoscyamus, Ipecacuanha, Lobelia, Myrrha, Nitro-glycerine, Potass. Bromid., Pot. Iod., Pyridin, Quebracho, Sodii Nitris Purus, Stramonium, Pulv. Stramonii Comp., Tabaci Folia.

**Astringents.**—Section A.

*Baldness.* Acetum Cantharidis, Liniment Ammon., Lin. Camph. Co., Lin. Chloroformi, Linimentum Crinale, Lin. Crotonis, Lin. Sinapis Co., Lotio Crinalis, Lotio Stimulans, Pilocarpina.

*Bed Sores.* Argenti Nitras, Acid. Sulphuros., Amadou, Balsami Peruviani Ung., Collodium, Plumbi Tannici Ung., Zinci Oxid. Ung.

*Bile, deficiency of.* Fel Bovinum. *See Cholagogues.*

*Biliary Calculi.* See *Gall-stones.*

*Bites of fleas, to prevent.* Lavand. Ol., Pyrethrum Roseum, Camphora.

*Bites and Stings of Insects* (ants, bees, gnats, mosquitoes, wasps). Liquores Ammoniæ, Potassæ, Sodæ, Plumbi Subacetatis; Chloroform, Ipecacuanha, Oleum Carbolisatum, Olea Olivæ and Pulegii. ; *all locally.*

*Bites of Rabid Animals.* Cautery.

*Bites of Snakes.* Liquor Ammoniæ, Liq. Potass. Permang.; Cautery.

*Bladder, irritable.* Belladonna, Cannabis Ind., Chloral Hydras, Hyoscyamus, Opium. *Mineral Waters:* Fachingen, Malvern, Pougues, Langenbrücken, Luhatschowitz. See also *Cystitis.*

*Blennorrhœa.*—See *Gonorrhœa.*

*Blister, to heal.* Unguent. Cetacei.

,, *to keep open.* Ung. Mezerei, Ung. Sabinæ.

*Blood restorers.*—See *Tonics.*

*Boils. Internally:* Calx Sulphurata, Cerevisiæ Ferment. *Locally:* Glycerinum Belladonnæ, Camphor. Spir., Collodium, Menthol, Opium.

*Bones, Fracture of. Locally:* Symphytum. *Internally:* Calcii Phosphas.

*Bowels, Torpidity of.*—See *Cathartics.*

*Brain, Inflammation of.*—See *Meningitis.*

*Breast, Inflammation of.* Glycerinum Belladonnæ, *locally:* Phytolacca, *internally* and *locally.*

*Breath, Fœtor of.* Acid. Carbolic., Glycer. Acid. Carbolic., Camphor, Carbo Ligni, Creasote, Pepsin, Potass. Chloras, Potass. Permang.

*Bright's Disease, Acute Inflammatory:* Aconite, Ammon. Carb., Belladonna, Cannabis Ind., Copaiba, Digitalis, Elaterium, Tinct. Ferri Perchlor., Pulv. Jalapæ, Juniper Ol., Pilocarpin., Pot. Acetas, Pot. Tart. Acid., Scilla, Scoparium, Spir. Ætheris Nitrosi.

—— *Albuminoid.* Tinct. Ferri Perchlor., Nux Vomica, Quinine, Easton's Syrup.

—— *Cirrhotic.* Nitroglycerine. See also *Albuminuria, Dropsy* (*renal*) and *Uræmia.*

*Bronchitis, Acute.* Acid. Benzoic., Aconitum, Æther, Ammoniacum, Ammonii Carbon., Ammon. Chloridum, Antim. Tart., Apomorphina, Asafœtida, Tinct. Camph. Co., Chloral, Sp. Chlorof., Cimicifuga, Ferri et Am. Citras, Tinct. Ferri Acet. Æther., Galbanum, Ipecac., Larix, Lobelia, Plumbi Acet., Scilla, Croton. Lin., Senega, Sinapis Cataplasma, Terebinth. Confectio. *Mineral Waters:* Kronthal, Labassère, Landeck, Langenbrücken, Lippspringe, Luhatschowitz, Neuenahr.

—— *Chronic.* Æthyl Iodidum, Iodi Lin. and Vapor, Asafœtida, Bals. Peru and Tolu, Tinctura Benzoini Co., Chloral, Conini Vapor, Copaiba, Creasoti Vapor, Eucalypti Oleum, Euphorb. Pilulif., Grindelia, Lobelia, Opium, Pini Pumil. Ol., Pini Sylvest. Ol., Quillaia, Quinina, Senega, Serpentaria, Tar Syrup, Tar Water, Terebene.

*Bronchocele.* Acidum Fluoricum Dil., Hydrarg. Iodid. Rub. Ung., Iodum, Potass. Iodid.

*Brow Ague.* See *Neuralgia.*

*Bruises.* Acetum, Acid. Acetic. Dil., Alum, Anthemis, Arnica, Capsicum, Hamamelis, Plumb. Subacet. Dil. Liq., Saponis Linim., Sodii Chlorid., Sp. Vini Rect., Ammon. Chloridi Lotio.

*Bubo, Acute:* Glycerin. Belladonnæ, Iodoform, Lotio Acidi Carbolici, Liquor Chlori.

—— *Indolent.* Lotio Plumbi Subacet., Unguentum Zinci.

—— *Chancrous.* Acid. Carbol., Argent. Nitras, Liq. Hydrarg. Nit. Acid., Potassa cum Calce.

*Bunions.* Amadou Plaster.

*Burns and Scalds.* Acid. Borici Ung Oleum Carbolicum, Acid. Salicyl. Lotio, Calcis Lin, Calcii Carbonas, Calcis Chlorin. Liquor, Carron Oil, Cocaina, Collodion, Creasotum, Creta Præpar., Eucalyptus Gauze or Oil, Iodoform and Vaselin, Flour, Gossypium, Lini Oleum, Olivæ Oleum, Starch, Sp. Vini Rect., Terebinth. Oleum.

*Bursitis, Acute:* Acid. Carbol. (inject.), Blister, Tinct. Iodi (paint or inject.), Zinc. Chlorid. (inject.).

*Calculus, Renal.* See *Colic, Renal.*

*Calculi, Lithic Acid.* Ammon. Benz., Ammon. Boras, Ammon. Phosph., Lithium Salts, Potassii Acetas, P. Bicarb., P. Carb., P. Citras, P. Nitras, Sodii Bicarb. *Mineral Waters:* Carlsbad, Fachingen, Friedrichshall, Pullna, Vals, Vichy, Wiesbaden.

—— *Phosphatic.* Acid. Benzoic., Ac. Nitric. Dil., Acid. Phosph. Dil., Pareiræ Extr. Liquid., Tonics.

*Cancer. Locally:* Acid. Carbol., Acid. Nitric., Acid. Sulph. (Nordhausen), Arsenical Paste, Glyc. Acid. Tannic., Antim. Chlorid., Conium, Hydrarg. Nit. Acid. Liq., Iodoform, Potassa cum Calce, Potass. Permanganas, Zinci Chloridum. *Internally:* Chloral Hydras, Conium, Opium, Terebinth. Chia.

*Carbuncles.* See *Boils.*

**Carminatives.**—Section A.

*Catarrh of the Respiratory Organs.* Aconitum, Ammoniacum, Ammon. Chlor., Sp. Ammon. Fœtid., Amygdala Dulc., Apomorphia, Bals. Peruv., Benzoin Vapor and Insufflat., Cetraria, Dulcamara, Eucalyptol, Ferrier's Snuff, Glycyrrhiza, Ipecacuanha, Lini Semen, Lobelia, Sp. Æther. Nit., Myrrha, Opium, Pix Liquid., Quininæ Sulph., Senega, Syr. Pruni Virg.

—— *Vesical.* See *Cystitis.*

*Chafing of Skin.* Dusting Powder, Starch, Violet Powder.

*Chalk Stones in Gout.* Ammonii Benzoas.

**Cathartics.**—Section A.

**Caustics.**—Section A.

*Chancres.* Acid. Nitric., Acid. Pyrogall., Acid. Sulphuros., Argenti Nitras, Eucalyptol, Bismuthi Subiodid., Iodoform, Iodol, Hydrarg. Lotio Nigra, Hydr. Nitrat. Liq. Acid., Hydr. Ox. Rubr. *All locally.*

*Chaps.* Cerat. Camphor., Glycerini Unguentum.

*Chilblains.* Alum Poultice, Argenti Nitras, Boracis Ung., Calcis Chlorinatæ Liq., Capsici Liniment. or Tinct. Fort., Creasotum, Glycerinum, Iodi Unguent.

*Chlorosis.* Acid. Hydrochloric. Dil., Ferri Bromidi Syrup., Ferri Chlorox. Liq., Ferri Lactas, Ferri Perchlor. Tinct., Ferrum Redactum, Ferri Sulphas, Myrrha, Niccoli Sulphas. *Mineral Waters:* Contrexéville, Franzensbad, Rippoldsau.

**Cholagogues.**—Section A.

*Cholera.* Acid. Tannic (enema), Ammon. Carb., Argenti Nitras, Camphor, Capsicum, Chlorodyne, Board of Health Cholera Mixture, Creasotum, Pulv. Salinus (Dr. Stevens), Sodii Chlorid., Sumbul.

—— *Infantum.* Acid. Lacticum, Acid. Salicylicum, Acid. Sulph. Dil., Creasotum, Glycerinum Boracis, Hydr. Subchlor., Menth. Pip. Ol., Resorcin, Rheum, Ol. Ricini.

*Chordee.* Belladonna, Camphor, Lupulinum, Opium, Potassii Bromidum.

*Chorea.* Antipyrin, Argenti Nitras, Arsenic. Liquor, Camphora Monobrom., Cerii Oxalas, Chloral, Cimicifugin, Conium, Cupri Sulphas, Curare, Ferrum Redactum, Hyoscyamus, Nux Vomica, Physostigma, Ruta, Valeriana, Zinci Sulphas, Zinci Valerianas.

*Cold in the Head.*—See *Coryza.*

*Colic, Intestinal:* Æther, Ammonia, Belladonna, Opium.

—— *Biliary:* Æther, Chloroform (inhalation), Opium. Hot baths.

—— *Renal:* Chloroform (inhalation) and Opium. Hot baths.

*Conjunctiva, Inflammation of.* See *Ophthalmia.*

*Constipation.* Aloes Decoct. Co., Belladonna, Cambogia, Cascara Sagrada, Cassiæ Pulp., Colocynth. Pil. Co., Croton Ol., Elaterini Pulv. Co., Ficus, Glycerine (enema), Glycyrrh. Pulv. Co., Hydrarg. Subchlor., Iridin, Jalap, Magnesia, Magnesiæ Sulph., Manna, Mel, Nux Vomica, Olivæ Ol., Potass. Tart. Acid., Ricini Ol., Rheum, Sapo Castil., Scammonium, Senna, Soda Tartarata, Sodii Phosphas, Sulphur, Tabaci Enema. *Mineral Waters:* Carlsbad, Carlsbad Salt, Friedrichshall, Hunyadi Janos, Pullna.

—— *of Infants.* Cassiæ Pulpa, Cascara Elixir, Glycyrrh. Pulv. Co., Magnesia, Rhei Pulv. Co., Ricini Oleum, Scammon. Pulv. Co., Sennæ Syrupus.

—— *Habitual:* Belladonna, Cascara Sagrada, Cassiæ Pulpa, Senna.

—— *Obstinate:* Cambogia, Colocynthis, Croton. Ol., Guaiacum, Tabaci Enema, Podophyllin.

*Consumption.* See *Phthisis.*

*Convalescence from Acute Disease.* Acid. Sulph. Dil., Calumba, Cascarilla, Chirata, Cinchona, Cusparia, Guarana, Quassia.

*Convulsions.* Ammon. Fœtid. Sp., Belladonna, Chloral Hydras, Chloroform, Opium, Potass. Bromid., Rutæ Oleum, Enema Terebinth.

*Cornea, Abscess of.* Abri Infusum.

—— *Inflammation and Ulceration of:* Argenti Nitras, Belladonna, Hydrarg. Ox. Flav. Ung., Physostigmina.

*Corns.* Acid. Aceticum Glaciale, Ammon. Chlorid., Argent. Nitras, Collodium Salicylicum, Cupri Oleatis Unguentum, Plumbi c. Sapone Emp.

*Corpulency.*—See *Obesity.*

*Coryza.* Acidum Tannicum, Benzoini Vapor and Insufflatio, Camphoræ Spiritus, Ferrier's Snuff, Sodii Chloridum, Zinci Oxidum.

*Cough.* Acid. Sulph. Dil., Antim. Vinum, Acaciæ Gum., Amygdalæ Aqua and Mistura, Apomorphina, Bals. Tolu, Cetaceum, Codeinæ Syr. and Pastilles, Conium, Copaiba, Cubeba, Glycerinum, Glycyrrhiza, Ipecacuanha, Lini Semen, Lobelia, Morphinæ Troch., Scilla, Styrax Præp. See also *Expectorants*, Section A.

—— *Chronic.* Benzoini Tinct. Comp., Cerii Oxalas.

—— *Spasmodic.* Acid. Hydrocyan. Dil., Belladonna, Cannabis Indica, Ammon. Brom., Butyl-Chloral Hydras, Tinct. Camph. Comp., Cerii Oxalas, Conium, Hyoscyamus, Pruni Virg. Syrupus, Stramonium.

—— *Tickling.* Acaciæ Gum., Acid. Phosph. Dil., Morphina, Cannab. Ind. Tinct.

*Cramp.* See *Antispasmodics.*

*Croup.* Aconite, Apomorphina, Emetics, Alum, Antim. Tart., Cupri Sulph., Ipecacuanha, Lobelia.
*Locally:* Papain.
*Externally:* Camph. Linim. Co.

*Cutaneous Diseases.* See *Eczema, &c., &c.*

*Cystitis.* Acid. Benzoic., Ammonii Benzoas, Betol, Buchu, Collinsonia, Hydrastis, Naphthalene, Pareira, Injections of Boric Acid, Quinine or Thymol.

*Dandriff.* Borax Lotion.

*Deafness.* Amygdalæ Oleum, Glycerinum, Pilocarpina (hypodermic).

*Delirium.* Antim. Tart., Belladonna, Cannabis Indica, Hyoscyamina, Hyoscina, Methylal, Opium, Potass. Bromidum.

—— *Tremens.* Ammoniæ Liquor, Antim. Tart., Cannabis Indica, Camphora Monobrom., Capsicum, Chloral Hydras, Digitalis, Hyoscyamina, Hyoscina, Opium, Potass. Bromid., Strychnina.

**Demulcents.**—Section A.

*Depilatory.* Calx Sulphurata.

**Desiccants.**—Section A.

*Diabetes.* Acid. Phosphor. Dil., Almond Cakes, Antipyrin, Arsenii Bromidi Liquor, Creasotum, Codeina, Ferri Perchlor. Tinct., Ferri Phosphas, Jambul, Morphina, Pilocarpina, Phosphorus, Potass. Permanganas, Saccharinum, Sodii Salicylas. *Mineral Waters:* Carlsbad, Vichy.

—— *Insipidus.* Ergota.

**Diaphoretics.**—Section A.

*Diarrhœa.* Acid. Carbolicum, Acid. Nitric Dil., Acid. Phosph. Dil., Acid. Sulph. Dil., Acid. Tannic., Amylum, Belæ Fructus, Bismuthi Subnitras, Calcis Liquor, Calcii Carbon., Calcis Sacch. Liquor, Camphoræ Essentia, Capsicum, Castoreum, Catechu, Creta Præp., Cholera Mixture, Doveri Pulv., Granati Cort., Guarana, Gummi Rubrum, Hæmatoxylum, Hydrarg. cum Creta, Kino, Naphthol, Opium, Plumbi Acetas, Quininæ Carbolas, Rhei Tinct., Ricini Oleum, Simaruba, Dr. Stevens' Pulvis Salinus.

—— *Chronic:* Cascarilla, Coto, Cupri Sulph., Cinchona, Ferri Pernit. Liquor, Hæmatoxylum, Krameria, Plumbi Acetas, Quininæ Sulph., Simaruba.

**Disinfectants.**—Section A.

*Diphtheria.* Acid. Carbolic. Glycerin., Acid. Hydrochloric, Acid. Lacticum (spray), Acid. Sulphuros. (spray), Argenti Nitras, Chloral Hydras, Chlori Liquor, Eucalyptol, Ferri Perchlor. Liq. Fort., Glycerin., Helenine, Iodi Tinct., Iodoform, Iodol, Magnes. Boratis Liquor, Mag. Sulphis, Papain, Phenol Camphor, Potas. Chloras, Potas. Permanganas, Quininæ Sulphas, Resorcin, Sodæ Chlorinatæ Liquor.

*Dipsomania.* Capsicum.

**Diuretics.**—Section A.

*Dropsy, in all forms.* Ammon. Benzoas, Ammon. Chlorid., Buchu, Cajuputi Ol., Cambogia, Colchicum, Croton. Ol., Hydrarg. Subchlor., Jalapa, Juniperi Oleum, Lactuca, Nux Vomica, Potass. Acet., Potass. Iodidum, Potass. Tart. Acid., Scilla, Scoparius, Spir. Ætheris Nitrosi, Veratrum Viride.

—— *Cardiac:* Apocynum, Caffeina, Convallaria, Digitalis, Elaterium, Sparteina, Ulexine, Veratrum Viride.

—— *Hepatic:* Ammon. Chlor., Copaiba, Hydrarg. Subchlor., Taraxacum.

—— *Renal:* Ammon. Acetat. Liquor, Copaiba, Elaterium, Juniperi Oleum, Pilocarpina, Potassii Iodidum.

*Dysentery.* Acidum Tannicum, Bela, Cascarillæ Infus., Cubebæ Oleum, Cupri Sulph., Cuspariæ Infusum, Doveri Pulv., Guarana, Gummi Rubrum, Hæmatoxylum, Hydrarg. Perchlor., Ipecacuanha, Lini Decoct., Naphthalene, Phenol Iodatu

Plumb. Acet., Ricini Oleum, Simaruba, Sodæ Chlorin. Liq., Sumbul.

*Dysentery, Chronic.* Argenti Nitras (enema), Cetraria, Cusparia, Hæmatoxylum, Plumbi Acet., Plumbi Pil. c. Opio, Rheum, Simaruba, Uva Ursi.

*Dyspnœa.* Æther, Æthyl Iodidum, Amyl Nitris, Lobelia, Pyridin.

*Dysmenorrhœa.* Ammon. Acetat. Liquor, Amyl Nitris (inhalation) Antipyrin, Apiol, Bromides, Cannabis Indica, Cimicifuga, Ergota, Senega.

*Dyspepsia.* Acid. Hydrocy. Dil., Æther, Aloes, Ammoniæ Liquor, Bismuthi Carb., Bismuthi Subnitras, Buchu, Calcis Liq., Carbo Ligni, Caryophylli Ol., Cascarillæ Inf., Cerii Oxalas, Cetraria, Hæmatoxylum, Limon, Magnesia, Malt Extract, Menispermin, Papain, Pepsin, Peptonised Foods, Potassæ Liquor, Potass. Bicarb., Potass. Sulph., Quassia, Rheum, Salicinum, Sapo Durus, Senna, Serpentaria, Sodæ Liq., Sodii Bicarb., Sodii Carb., Sodæ Chlorin. Liq., Zingiber. *Mineral Waters:* Alet, Apollinaris, Charlottenbrunnen, Dinsdale, Ems, Gilsland, Homburg, Orezza, Vals. See also *Carminatives* and *Tonics, Stomachic.*—Section A.

—— *Atonic:* Acid. Sulph. Dil., Anthem. Inf., Armoracia, Calumba, Camphora, Capsicum, Castoreum, Catechu, Ferrum Salts, Chiretta, Gentiana, Hæmatoxylum, Hydrastis, Nux Vomica, Pepsin, Piper Nig., Potassii Ferrocyanidum.

—— *Irritative:* Bismuthi Subnitras, Cerii Oxalas.

*Ear, Diseases of.* Iodoform, Iodol.

**Ecbolics.**—Section A.

*Eczema.* Acid. Carbolic., Acid. Salicylic., Aluminii Oleatum, Argenti Nitras, Bismuthi Lotio, Creasoti Ung., Cremor Lithargyri, Glycerinum, Hyd. Ammon. Ung., Hydrarg. Subchlor. Ung., Ichthyol, Sodii Arsenias, Sozoiodol, Zinci Oxidum, Ung. Glycerin. Plumbi Subacetatis. *Mineral Water:* Aix-les-Bains.

—— *Chronic:* Acid. Arseniosum, Ol. Betulæ Ung., Cadini Oleum, Hydrarg. Nitrat. Ung., Hyd. Oxid. Flav. Ung., Naphthol, Paraffinum Liquid., Resorcin, Zinci Oxidum.

**Emetics.**—Section A.

**Emmenagogues.**—Section A.

**Emollients.**—Section A.

*Epilepsy.* Acid. Arseniosum, Ammon. Bromid., Amyl Nitris, Argenti Nitras, Auri Bromidum, Belladonna, Camphora Monobrom., Castoreum, Cerii Oxalas, Cupri Sulphas, Ferri Perchlor. Tinct., Moschus, Niccoli Bromidum, Nitroglycerine, Picrotoxinum, Potassii Bromidum, Sodii Nitris Purus, Strychnina, Valeriana, Zinci Bromidum, Z. Sulph., Z. Valerianas.

*Epistaxis.* Acid. Tannic, Alum, Ergota, Galla, Gummi Rubrum Extract. Liquid., Ferri Chloroxydi Liquor, Hamamelis.

*Erysipelas. Locally:* Acid. Carbolicum (spray), Acid. Sulphurosum (spray), Amyli Glycer., Amylum, Argenti Nitras, Belladonnæ Glycerinum, Collodium, Creasotum, Creta, Ichthyol, Lycopodium, Salol. *Internally:* Aconitum, Belladonna, Cinchona, Ferri Perchlor. Tinct., Quinina.

**Escharotics.**—Section A.

*Evacuations, Fœtid.* Potas. Permangan., Sodæ Chlorinatis Liquor.

*Excoriations.* Alum, Amylum, Boracis Glycerinum, Fuller's Earth, Glycerini Ung., Plumbi Carb., Zinci Oxid.

**Expectorants.**—Section A.

*Expectoration, Fœtid:* Acid. Carbolic., Potass. Permanganas, Chlori Liq.

—— *to diminish:* Aconitum, Belladonna, Larix, Opium, Quinina.

*Eyes, application for the.* Alum, Aurantii Floris Aqua, Acidi Borici Lotio, Acidi Hydrocyanici Vapor, Chloroformi Vapor, Cocainæ Lamellæ, Cydonii Decoct., Lotio Gummi Rub., Hyd. Iod. Rub. Ung. (dil.), Hyd. Nitrat. Ung. Dil., Lapis Divinus, Opii Vinum. Ricini Ol.

—— *to contract pupil of:* Physostigmina, Pilocarpina; Gelsemium (*internally*).

—— *to enlarge pupil of:* Atropina, Belladonna, Daturina, Homatropina, Hyoscyamina, Hyoscina, Scopola, Gelsemium (*locally*).

*Fæces, Impacted.* Lini Enema, Ricini Olei Enema.

*Fainting.* See *Syncope.*

*Fascia, Contracted and Indurated.* Ung. Hydrarg. Iod. Virid. cum Atropina.

**Febrifuges.**—Section A.

*Feet, perspiring.* Pulvis Salicylic. cum Talco, Salicylic Suet, Zinci Oxid. Ung.

*Fever.*—See *Antipyretics.* Section A.

—— *hay:* See *Hay Fever.*

—— *intermittent:* Arsenicalis Liquor, Beberinæ Sulph., Berberis, Capsici

Tinct., Cascarilla, Cinchona, Cinchonidina, Cinchonina, Cuspariæ Cort., Ipecacuanha, Kino, Quassia, Quinina, Salicin, Santoninum, Sodii Chloridum.

—— *puerperal:* Chloral Hydras, Potassii Bromidum, Opium.

—— *remittent:* Cinchona, Beberinæ Sulphas, Quininæ Sulphas.

—— *scarlet:* Acid. Carbolicum, Acid. Sulphurosum, Aconitum, Ammon. Benz., Ammon. Carb., Belladonna, Juniperi Oleum. *Locally:* Acid. Acetici (vapor), Acid. Carbol. (spray), Acid. Sulphurosum (spray), Chlori Liquor, Resorcin, Sodæ Chlorinatæ Liquor.

—— *typhoid:* Acid. Carbolic. (Mistura), Acid. Nitr. Dil., Ammon. Liq., Amyli Enema, Antifebrin, Argent. Nitr., Belladonna, Chlori Liq., Cusparia, Magnesii Salicylas, Naphthalene, Naphthol, Serpentaria, Sumbul Tinct., Thallinæ Sulphas.

*Flatulence.* Acid. Carbolicum, Acid. Sulphurosum, Æther, Aloes, Anethum, Anisum, Armoraciæ Spirit. Co., Asafœtida, Bismuth, Cajuputi Ol., Capsicum, Carbo Ligni, Caryophyllum, Fœniculi Ol., Lavand. Oleum, Menthæ Pip. Ol., Menthæ Virid. Ol., Piper Nigrum, Rutæ Enema, Terebinthinæ Enema, Zingiber.

*Flooding.* See *Hæmorrhage, Uterine.*

*Gall Stones.* Æther, Belladonna, Chloral Hydras, Chloroformum, Morphina, Olivæ Oleum, Ricini Oleum, Sapo Durus, Sodii Carb., Sodii Phosphas, Terebinthinæ Oleum. *Mineral Water:* Carlsbad.

*Gangrene.* Tonics and Stimulants. *Locally:* Antiseptics.

*Gastralgia.* Acid. Arseniosum, Acid. Hydrocyan. Dil., Æther, Argenti Nitras, Belladonna, Bismuth Salts, Carbo Ligni, Cerii Oxalas, Cocaina, Manganesii Oxidum Nig., Opium, Pepsin.
*Mineral Water:* Contrexéville.

*Generative Organs, loss of tone.*—See *Aphrodisiacs.*

—— *Sedative of.*—See *Antaphrodisiacs.*

*Glands, enlarged and indurated.* Acid. Arseniosum, Ammonii Chloridum, Ammoniaci c. Hydrarg. Emplast., Crotonis Oleum, Cadmii Iodid., Calcii Chlorid., Calx Sulphurata, Carbon. Bisulphidum, Fucus Vesiculosus, Morrhuæ Oleum, Iodi Linim., Iodi Tinct. (inject.), Potass. Iodid., Lin. Potass. Iodid. c. Sapone, Sodæ Chlorinatæ Liquor. *Mineral Waters:* Kœnigsdorff, Leuk, Marienbad.

*Gleet. Internally:* Bals. Peruvianum, Copaiba, Creasotum, Cubebs, Ferri Perchlor. Liquor, Santali Oleum. *Locally:* Acid Tannic, Cupri Sulphas, Plumbi Acetas, Zinci Sulphas.

*Goître.*—See *Bronchocele.*

*Gonorrhœa, Acute. Internally:* Aconitum, Antim. Tart., Hordei Decoct., Lini. Inf., Methylene Blue, Potass. Bicarb., Santal. Flav. Ol. *Locally:* Betol, Bismuth. Subnit., Iodoform and Eucalyptus Bougies, Zinci Acetas, Z. Chlorid., Z. Permang., Z. Sulphocarbolas.

—— *Chronic. Internally:* Copaiba, Cubeba, Santali Oleum. *Locally:* Argenti Nitras (bougie), Plumbi Acetas cum Opio, Zinci Acetas, Z. Chloridum cum Belladonna, Z. Sulphas.

*Gout.* Acid. Benzoicum, Ammonii Benzoas, Ammonii Phosphas, Caffeinæ Tri-iodidum, Cajuputi Ol., Colchicum, Crotonis Oleum, Gynocardiæ Oleum, Hyoscyamus, Lithii Benzoas, L. Bromidum, L. Carbonas, L. Citras, L. Guaiacas, Magnesia, Piperazine, Potass. Acetas, P. Citras, Sabina, Serpentaria, Sodii Benzoas, S. Carbonas, S. Phosphas, S. Taurocholas. *Mineral Waters:* Adelheidsquelle, Aix-les-Bains, Baden-Baden, Buxton, Carlsbad, Eilsen, Ems, Franzensbad, Ischia, Marienbad, Nenndorf, Neuenahr, Ofen, Plombières, Soden, Strathpeffer, Tarasp, Toeplitz, Vichy, Weilbach, Wiesbaden, Wildbad.

—— *painful:* Aconitinæ Unguent., Antipyrin, Cajuputi Oleum, Colchici Extr. c. Pulv. Doveri, Hyoscyamus, Menthol, Potass. Iodidum, Veratrinæ Unguentum.

*Gums, inflamed.* Krameriæ Tinct.

—— *spongy:* Gummi Rubri Tinct., Myrrhæ Tinct., Potass. Chloras, Quercus Decoct., Tinct. Myrrhæ et Boracis.

*Hair falling off.*—See *Baldness.*

*Hay Fever.* Antipyrin, Belladonna, Camphoræ Spirit., Cannab. Ind., Cocaina, Grindelia Robusta, Lobelia Inflata, Quininæ Sulphas Acida, Stramonium.

*Hæmatemesis.*—Acid. Gallicum, Acid. Tannicum, Ergota, Hamamelis,

Plumbi Acetas, Terebinthinæ Oleum.

*Hæmaturia.* Acid. Sulph Dil., Acid. Tannic., Acid. Gallicum, Alumen, Ergota, Ferri Perchloridi Liquor, Hamamelis, Plumbi Acet., Terebinthinæ Oleum.

**Hæmatinics.**—Section A.

*Hæmoptysis.* Acid. Gallicum, Agaricus, Antipyrin, Atropina, Digitalis, Ergota, Ferri Acetatis Liquor, Hamamelis, Plumbi c. Opio Pilula.

*Hæmorrhage.* See *Styptics.*

—— *Uterine and post-partum:* Acetum, Acid. Gallic., Acid. Tannic., Cannabis Indica, Ergota, Hamamelis, Hydrastis, Limonis Succus, Matico.

*Hæmorrhoids.* Acid. Nitricum (lotio), Aloes Socot., Galbani Ung. Co., Gallæ Ung. and Ung. cum Opio, Hamamelis, Picis Pilulæ et Capsulæ, Piper Nigrum, Sulphur. *Mineral Waters:* Luhatschowitz, Mergentheim.

**Hæmostatics.**—Section A.

*Headache, nervous. Internally:* Acid. Hydrobrom. Dil., Ammon. Bromid., Ammon. Aromat. Spirit., Amyl Nitris (vapor), Antipyrin, Antifebrin, Cannabis Ind., Cimicifuga, Caffeina, Guarana, Magnesia, Nitroglycerine, Potass. Bromid., Potass. Ferrocyanid., Sodii Bicarb., Tinct. Succini. *Locally:* Aconitum, Æther, Belladonna, Camphora, Cocaina, Menthol.

*Heart, Valvular Disease of.* Adonis Vernalis, Apocynum, Caffeina, Convallaria, Digitalis, Erythrophlæum, Sparteina, Strophanthus.

*Heartburn.* See *Pyrosis.*

*Hectic Sweating.* See *Sweating.*

*Hepatics.* See *Cholagogues.* Section A.

*Hepatitis.* Ammon. Chlorid., Hyd. Subchlorid.

*Hernia, strangulated.* Chloroformum.

*Herpes.* Acid. Acetic., Argenti Nitras, Ferri Arsenias, Glycerinum, Hydrargyrum Ammoniatum, Iodum, Morphinæ Oleas, Ulmi Decoctum, Zinc Salts.

*Hooping Cough.* Acid. Carbolic., Acid. Cresylicum (inhal.), Alum, Ammon. Bromid., Antipyrin, Atropina, Belladonna, Bromoform, Cannabis Ind., Chloral, Tinct. Chloroformi et Morphinæ, Conium, Eucalypti Oleum, Euphorbia Pilulif., Grindelia, Hydrogen. Peroxid., Ipecacuanha, Lobelia, Potass. Bromid., Quinina, Resorcin, Succini Lin., Trifolii Syrupus, Zinci Sulphas.

*Hiccough.* Anethum, Apomorphia, Belladonna, Chloroformum, Ergota, Physostigma, Pilocarpina, Sinapis Infusum.

*Hydrocele.* Glycerinum Acidi Carbolici, Glycerinum and Tinctura Iodi.

*Hydrocephalus.* Crotonis Oleum, Hydrarg. Subchloridum, Potass. Bromidum, Potass. Iodidum.

*Hydrophobia.* Aconitum, Cannabis Indica, Cantharis, Chloral Hydras, Chloroformum, Curare, Simaba Cedron.

**Hypnotics.**—Section A.

*Hypochondria.* Chloral Hydras, Lavandulæ Oleum, Potassii Bromidum. *Mineral Water:* Homburg.

*Hysteria.* Ammonii. Carb., Ammonii Bromid., Asafœtida, Auri Bromidum, Cajuputi Ol., Camphora Monobromata, Castoreum, Tinct. Chloroformi et Morphinæ, Lavand. Ol., Moschus, Nux Vomica, Phosphorus, Potass. Bromid., Rosmarini Ol., Rutæ Ol., Terebinthinæ Ol., Valeriana, Zinci Phosphidum, Z. Valerianas. *Mineral Waters:* Homburg, Lippik, Spa.

*Impetigo.* Hydrargyrum Ammon., Zinci Unguentum.

*Incontinence of Urine.* See *Urine.*

*Indigestion.* See *Dyspepsia.*

*Inflammation. Acute:* Aconite, Antim. Tart., Belladonna, Hydrarg. Subchloridum.

—— *Chronic:* Iodine, and Iodides.

*Influenza.* Acid. Sulphurosum (vapor). Ammon. Acetat. Liq., Antim. Tart., Benzoini Vapor, Sp. Æther. Nitr., Tinct. Quininæ Ammoniata.

*Insects, to keep away.* Camphora, Colocynth. Pulpa, Lavand. Oleum, Pyrethri Flores, Quassia, Rosmarini Oleum, Terebinth. Oleum.

*Insomnia.*—See *Hypnotics,* Section A.

*Intermittents.*—See *Fever.*

*Iritis.* Atropina, Belladonna, Hydrarg. Subchlor., Hyoscyamus, Potass. Iodidum, Quinina.

**Irritants.**—Section A.

*Issues, to keep open.* Mezerei Ung., Sabinæ Unguentum.

—— *to heal.* Acidi Borici Unguent, Cetacei Unguentum.

*Itch.*—See *Scabies.*

*Itching.*—See *Skin.*

*Jaundice.* Creasotum, Fel Bovinum, Hydrarg. Subchlorid., Pilocarpina, Potassa Sulphurata, Potassii Sulphas, Sapo Durus, Taraxacum.

*Joints, Diseased*
——— *Enlarged*
——— *Indurated*
Iodum, Hydrarg. Oleas., also with Morphia, Ung. Hydrarg. Comp., Potass. Iodid., Sodii Salicylas, Veratrinæ Ung.

*Kidneys, Diseases of,*—See *Albuminuria, Bright's Disease, Dropsy* (*Renal*), *and Uræmia.*
*Kidneys, hæmorrhage from.* Acid. Gallic., Iron Alum.

*Laryngeal Spasm.* Amyl Nitris.
*Laryngismus Stridulus.* Ammonia, Antipyrin, Chloral Hydras, Chloroformum, Potassii Bromidum.
*Laryngitis.* Ammon. Chloridum, Benzoini (vapor), Codeina, Creasoti (vapor), Menthol (spray), Pini Sylvestris Oleum. *Locally:* Acid. Sulphurosum (spray), Acid. Tannicum Glycerin., Argenti Nitras, Ferri Perchlor. Liquor.
**Laxatives.**—Section A.
*Leech bites, to stop.* Alum, Argenti Nitras, Ferri Perchlor., Ferri Chloroxidi Liquor, Matico.
*Leeches, to dislodge if swallowed.* Sodii Chloridum.
*Lepra.*—See *Psoriasis.*
*Leprosy.* Balsam. Dipterocarpi, Gynocardiæ Oleum.
*Leucorrhœa.* Acid. Boric., Acid. Gallic., Acid. Tannicum, Alumen, Catechu, Ferri Pernit. Liquor, Granati Cort., Gummi Rubrum, Hæmatoxyli Decoct., Krameria, Potass. Iodidum, Quercus Cort., Santal. Flav. Oleum, Sodii Sulphocarbolas, Styrax Præparatus, Zinci Sulph., Zinci Sulphocarbolas. *Mineral Waters:* Kreuznach, Wildungen.
*Lice.*—See *Pediculi.*
*Lichen.* Acid. Sulphurosum, Argenti Nitras, Glycerinum, Hydrarg. Oxid. Flav. Ung., Ichthyol.
*Lips, cracked.* Bals. Peru Unguent.
*Liver, Obstruction of.* Acid. Nitro-Hydrochlor. Dil., Alkaline Carbonates and Bicarbonates, Ammon. Chlorid., Euonymin, Chlori Liquor, Hydrarg. Subchlorid., Hydrarg. Pilula, Magnes. Sulphas, Sodii Sulphas, Soda Tartarata, Podophyllin. See also *Cholagogues.* Section A. *Mineral Waters:* Aix-la-Chapelle, Carlsbad, Ems, Friedrichshall, Kissingen, Leamington. Pullna. See also *Colic* (*Biliary*), and *Gall Stones.*
*Liver, Chronic enlargement of.* Acid. Nitro-hydrochloric. Dil. (*Internally and externally*). Potassii Iodidum.
*Locomotor Ataxy.* Argenti Nitras, Physostigma; Bodily Suspension.
*Lumbago.* Belladonna, Lin. Bellad. Comp., Cimicifuga, Lin. Opii Ammoniatum, Picis Burgundicæ Empl., Quininæ Sulphas.
*Lupus.* Acid. Arseniosum, Acid. Lacticum, Salicylic and Creasote Plaster Mull, Hydrarg. Iodid. Rub. Ung., Hydrarg. Nitrat. Ung., Iodi Causticum, Potassa cum Calce, Sodii Ethylatis Liquor.

*Malarial Fever.* Ammonii Picras, Warburg's Tincture, Quininæ Sulphas. See also *Fever, Intermittent.*
*Mania, Acute.* Cannabis Indica, Chloral Hydras, Cimicifuga, Gelsemium, Hyoscinæ Hydrobromas, Hyoscyamina, Methylal, Opium, Paraldehyde, Potassii Bromidum.
*Measles.* Aconitum, Ammon. Carb., Ammon. Acet. Liquor, Dover's Powder, Ipecacuanha, Potass. Citras, Quininæ Sulphas.
*Melæna.* Ergotin (hypodermic), Ferri Perchlor. (inject), Hamamelis, Plumbi Acet. cum Opio (inject), Terebinth. Oleum.
*Melancholia.* Camphora, Morphina, Paraldehyde, Potassii Bromidum. See also *Cathartics.*
*Meningitis, Acute.* Antim. Tart., Hydr. Subchloridum, Digitalis, Ergota, Potass. Bromidum, Potass. Iodidum, Purgatives; Ice externally.
*Menorrhagia.* Acid. Gallic., Beberinæ Sulphas, Bryonia, Cannabis Ind., Ergota, Hamamelis, Krameria, Plumbi Acet., Vincæ Major. Ext. Fluid.
*Menstruation, Defective.* See *Amenorrhœa.*
—— *Painful.* See *Dysmenorrhœa.*
*Metritis. Locally:* Argenti Nitras, Carbolic Acid and Glycerine, Tinct. Iodi.
—— *Granular.* Abri Infusum.
*Midges, to keep away.* Tereb. Ol.
*Milk Secretion, to increase.* Alcohol, Jaborandi, Ricini Fol. Decoctum.
—— —— *to diminish.* Belladonna.
*Miscarriage, to prevent.* Acid. Gallicum, Acid. Sulph. Dil., Ergota (small doses), Pilula Plumbi cum Opio., Viburnum.
*Mollities Ossium.* Calcii Phosphas.
*Mumps.* Hydrarg. cum Creta, Pilocarpina.

*Nævi.* Alum, Liq. Ferri Perchlor. Fort., Liq. Sodii Ethylatis, Zinc. Chloridum, Zinci Nitras.

*Nails, Split.* Stanni Oleatis Ung.

**Narcotics.**—Section A.

*Nausea.* See *Vomiting.*

*Neuralgia.* Acid. Arsenios., Acid. Osmicum, Aconiti Chloroform., Aconiti Linim., Aconitiæ Ung., Actæa Racemosa, Ammon. Bromidum, Ammon. Chlorid., Amyl Nitris, Antifebrin, Antipyrin, Beberinæ Sulphas, Atropinæ Solut. (hypodermically), Belladonnæ Lin., Brucine, Butyl-Chloral Hydras, Camphoræ Lin., Camphor. Lin. Co., Cannabis Indica, Chloral cum Camphora, Chloroformum, Cimicifuga, Cinchona, Cocaina, Conium, Crotonis Liniment., Delphinina, Exalgine, Ferrum, Ferri Oxid. Magnet., Gelsemii Tinctura, Gelsemin, Hyoscyamus, Iodoform, Menth. Pip. Oleum, Menthol, Morphina, Papaveris Decoctum, Phenacetin, Piscidia, Quininæ Sulph., Quininæ Dikinat. Syr., Sinapis Cataplasma, Veratrinæ Ung., Zinci Valerianas.

*Nipples, Sore.* Acid Tannic. Glycerinum, Argenti Nitras, Bals. Peru. Ung., Boracis Ung., Catechu, Sodæ Chlorinatæ Liq.

*Nitrate of Silver Stains, to remove.* Potass. Cyanid., Potass. Iodid.

*Nocturnal Emissions.* Belladonna, Ferri Bromid., Potass. Bromid.

*Nymphomania.* Camphora, Potassii Bromidum.

**Nutritive.**—Section A.

*Obesity.* Alkalies, Ferri Iodid. Fucus Vesiculosus, Potass. Iodid. *Mineral Waters:* Carlsbad, Ems, Kissingen, Marienbad, Tarasp.

*Ophthalmia.* Argent. Nit., Mitigated Caustic.

*Orchitis, Acute. Locally:* Glycerinum Belladonnæ. *Internally:* Saline Aperients, Antimonium Tartarat., Hyoscyamus.

*Otorrhœa.* Acid. Tannic. Glycerinum, Iodoform, Iodol, Potass. Permang., Zinci Chlorid., *all locally.*

*Ozæna.* Acid. Carbolic., Acid. Tannic., Borax, Boro-glyceride, Potass. Permanganas, Sodii Ethylatis Liquor, Zinci Chlorid., *all locally.*

*Palpitation.* Aconitum, Æther, Ammonia, Bromides, Camphora.

*Paralysis.* Belladonna, Cannabis Ind., Ergota, Hyoscyamus, Nux Vomica, Physostigma, Strychnina. *Mineral Waters:* Aix-la-Chapelle, Baden-Baden, Eilsen, Ischia, Kreuznach, Toeplitz.

—— *of Lead Poisoning.* Alkaline Sulphates, Potassii Iodidum.

*Pediculi.* Hyd. Ammon. Ung., Hydrarg. Oleas, Naphthol, Staphisagriæ Olei Ung.

*Periostitis.* Potassii Iodidum.

*Peritonitis, Acute.* Hydrarg. Subchlor., Opium.

*Perspiration, to diminish.* See *Anthidrotics.* Section A.

*Perspiration, Fœtid.* Acid. Carbolic. Glycer., Belladonna, Plumbi Oxid. Ung. Zinci Oxid. Ung.

*Phthiriasis.* See *Pediculi.*

*Phthisis.* Acid. Benzoic. (inhal.), Acid. Carbolicum, Acid. Gallicum, Acetophenone (inhal.), Acid. Hydrofluoric. (inhal.), Aconiti Tinct., Agaricin, Antifebrin, Aniline, Atropina, Calcii Hypophosphis, Camph. Tinct. Co., Carbonei Bisulphidum, Cerii Oxalas, Conium, Creasotum, Butyl-Chloral Hydrat., Eucalypti Ol. (inhal.), Guaiacol, Iodi Vapor, Iodoform, Malti Extractum, Morrhuæ Oleum, Opium, Picrotoxinum, Plumbi Acetas, Quinina, Saccharum Lactis, Salol.

*Piles.*—See *Hæmorrhoids.*

*Pityriasis Versicolor.* Glycerinum Boracis, Hydrarg. Oxid. Flav. Ung., Naphthol, Zinci Ung.

*Pleural Effusion.* Apocynum, Digitalis, Iodum, Pilocarpina.

*Pleuritis.* Aconitum, Antim. Tart., Crotonis Linim., Hydrarg. Subchlor., Potass. Iod., Sinapis Cataplasma.

*Pneumonia.* Aconitum, Ammon. Acetat. Liquor, Antim. Tart., Æther. Nitrosi Sp., Quinina, Sinapis Cataplasma.

*Polypi, Nasal. Locally:* Acid. Tannic., Sodii Ethylatis Liquor, Zinci Chloridum.

*Post-partum Hæmorrhage.* See *Hæmorrhage, Uterine.*

*Prolapsus Ani.* Acid. Tannic., Alum., Cupri Sulph., Ergotin, Ferri Perchlor., Gummi Rubr. Extr. Liq., Krameria, Nux Vomica, Sulphur.

*Prostration.* Æther, Ammonia, Caffeina, Coca, Moschus, Spiriti Vini Gallici Mistura.

*Prurigo. Internally:* Acid. Arsenios., Ammonii Bromid., Hyoscyamus, Quinina, Strychnina. *Locally:* Borax, Ichthyol, Iodoformum, Papaveris Decoctum, Liquor Carbonis Detergens, Potass. Cyanid., Sulphuris Ung.

*Pruritus Ani.* Hydrarg. Subchlor. Ung., Menthol.

—— *Pudendi.* Glycerinum Boracis, Cocaina, Ichthyol.

*Psoriasis.* *Internally :* Acid. Arsenios. *Locally :* Acid. Carbolic., Acid. Pyrogallic., A. Salicylic., Betula Alba, Chrysarobin, Creasotum, Saponis Emp., Glycerinum, Hydrarg. Subchlor. Unguent., Ol. Cadinum, Liquor Carbonis Detergens, Naphthol, Picis Unguent., Potassa Sulphurata, Resorcin, Sodii Carbonas.

*Puerperal Convulsions.* Chloral, Chloroformum (inhal.), Morphina, Potassii Bromidum.

**Purgatives.**—Section A.

*Purpura.* Ferri Perchlor. Tinct., Quinina, Ergota, Terebinthinæ Ol.

*Putrescence, to Correct.* See *Antiseptics*, Section A.

*Pyæmia.* Alcohol, Ammonia, Quinina. Antiseptics.

*Pyrosis.* Acid. Gallic., Acid. Sulphuros., Argent. Oxid., Bismuthi Subnitras, Bismuth. Carb., Catechu, Cerii Oxalas, Kino, Manganesii Oxid. Nigrum, Opium, Pulvis Doveri.

*Quinsy.* See *Tonsils, inflamed.*

**Refrigerants.**—Section A.

**Restoratives.**—Section A.

*Retention of Urine.*—See *Urine.*

*Rheumatism, Acute :* Acid. Salicylic., Acid. Benzoic., Aconitum, Antifebrin, Antipyrin, Betol, Cimicifuga, Gaultheriæ Ol., Opium, Pot. Acetas, Pot. Bicarb., Pulv. Doveri, Quinina, Salicinum, Salol, Sodii Salicylas.

—— *Chronic :* Acid. Salicyl., Ammon. Chlorid., Ammon. Phosph., Antim. Sulphurat., Antipyrin, Armoracia, Betol, Buchu, Capsici Tinct. Fort., Chloral, Chloroformum Camphoratum (local), Conium, Cajuputi Ol., Dulcamara, Gynocardiæ Ol., Guaiacum, Hydrarg. et Morphinæ Oleas, Iodi Lin., Camph. Lin. Co., Iodoform, Lithii Guaiacas, Menthol, Morrhuæ Oleum, Picis Burgundicæ Emplast., Pini Pumilionis Oleum, Pini Sylves. Ol., Potassæ Liquor, Lin. Pot. Iod. c. Sapone, Syr. Quininæ Hydriod., Sabina, Salol, Serpentaria, Sodii Hyposulphis, Sodii Iodid., Sodii Salicylas, Sulphur, Chelsea Pensioner, Terebinth. Oleum. *Mineral Waters :* Aix-les-Bains, Aix-la-Chapelle, Baréges, Baden-Baden, Bath, Berka, Buxton, Franzensbad, Hamman R'Irha, Lucca, Ofen, Toeplitz, Wiesbaden, Woodhall.

—— *painful.* Belladonnæ Chloroformum, Hydrarg. et Morphinæ-Oleas, Hyoscyami Lin. Co., Lin. Camph. Co.

*Rickets, Rachitis.* Acid. Phosphor. Dil., Calcis Liquor, Calcii Phosphas, Creta Præparata, Ferri Phosphas, Morrhuæ Oleum, Chemical Food.

*Ringworm.* Acid. Acetic., Acid. Salicylic., Cupri Oleatis Ung., Glycerinum Acid. Carbol., Hydrarg. Oxyd. Flav. Ung., Hyd. Sulphatis Flav. Ung., Pigmentum Picis c. Iodo, Ung. Picis, Resorcin, Ung. Sulphuris Comp.

**Rubefacients.**—Section A.

*Salivation, to produce.* See Sialagogues, Section A.

—— *to diminish.* Atropina, Belladonna.

*Sarcina Ventriculi.* Acid. Sulphuros., Potassii Sulphis, Sodii Sulphis, Sodii Hyposulphis.

*Scabies.* Acid. Sulphuros, Adeps Præparatus, Calcis Chlorinat. Liq., Hydrarg. Ammoniatum, Naphthalene, Naphthol, Potassa Sulphurata, Staphisagriæ Olei Ung., Sulphuris Hypochlor. Ung., Sulphocarbolates, Sulph. Ung. Co., Sulphuris. Ung.

*Scalds.* See *Burns and Scalds.*

*Scarlet Fever.* See *Fever, Scarlet.*

*Sciatica.* Acid. Osmic., Aconiti Lin., Antipyrin, Iodoformum, Bellad. Lin. Comp., Opium, Sodii Salicylas. See also *Rheumatism.*

*Scorbutic Affections.* See *Scurvy.*

*Scrofula.* Calcii Chloridum, Calcii Phosphas, Calx Sulphurata, Creta Præparata, Ferri Iodid., Ferri Phosphatis Syrup. Co. (Chemical Food), Galium Aparine, Hyd. Iod. Virid. Ung., Hyd. Subchlor., Iodum, Morrhuæ Oleum, Potass. Iod., Potassæ Liquor, Pot. Bicarb., Quinin. Sulph., Sodii Hyposulphis, Sodii Iodidum. *Mineral Waters :* Adelheidsquelle, Arnstadt, Baréges, Cauterets, Ems, Ischia, Kœnigsdorff, Kosen, Krankenheil, Kreuznach, Luhatschowitz, Neuenahr, Reichenhall, St. Moritz, Shap, Soden, Strathpeffer, Vals, Woodhall.

*Scurvy.* Acid. Citricum, Potass. Citras, Limonis Succus.

*Scybala.* Enemata Olei Lini and Olei Ricini.

*Sea Sickness.* Amyl Nitris, Caffeinæ Citras, Camphora, Capsici Tinct., Cerii Oxalas, Chloral, Chloroformum, Creasotum, Cocainæ Hydrochloras, Nitroglycerine, Sodii Bromidum.

*Seborrhœa Capitis.* Ung. Hydrarg. Sulphat. Flav.

**Sedatives.**—Section A.

**Sialagogues.**—Section A.

*Sickness, to arrest.*—See *Vomiting.*

*Skin, Abraded.* Collodium.—See *Excoriation.*

*Skin, Cracks in.* Amyli Glycerinum, Cydonii Decoct.

—— *Itching of.* Acid. Hydrocyan. Dil., Amygd. Amaræ Mist., Acid. Citric., Acid. Tartaric., Calx Chlorinata.

—— *Tender.* Chloroformi Linimentum.

*Sleeplessness.*—See *Hypnotics,* Section A.

*Small Pox.* Acid. Carbolic. Glycerinum, Acid. Salicylic., Antifebrin, Argenti Nitras (*local*), Chlori Liq., Potassii Chloras, Quinina.

*Snake Bites.*—See *Bites.*

**Soporifics.**—Section A.

*Sneezing, paroxysmal.* Acid. Arsenios., Iodum, Potassii Iodidum.

*Sores.*—See *Ulcers.*

*Sores, Bed.*—See *Bed Sores.*

*Sore Nipples.*—See *Nipples, Sore.*

—— *Throat.* Acid. Sulphuros. (Spray), Acid. Tannic. (Spray), Cubeba, Gummi Rubrum, Mori Syrup., Myrrha, Potass. Nitras, Potass. Chloras, Rosæ Infusum.

—— —— *Malignant.* Argenti Nitras, Capsicum, Chlori Liquor.

—— —— *Putrid.* Acid. Carbolic., Potass. Permang., Chlori Liquor.

—— —— *Relaxed.* Alum, Capsicum, Gummi Rubrum, Krameria, Glycer. Ferri Perchlor.

—— —— *Ulcerated.* Acid. Hydrochlor. Dil., Argenti Nitras, Boracis Glycerinum, Hydrarg. Perchlorid.

*Spasmodic Affections.*—See *Antispasmodics,* Section A.

*Spermatorrhœa.* Belladonna, Camphora Monobromata, Digitalis, Potassii Bromidum, Strychnina.

*Spina Bifida.* Iodo-Glycerine Solution (Morton's) injected.

*Spleen, Enlargement of.* Potassii Bromidum, Potassii Iodidum, Purgatives.
*Locally:* Ung. Hydrargyri, Iodidi Rubri.

*Sprains.* Lin. Saponis, Sp. Vini Rectif. (lotion), Cold Douche.

**Stimulants.**—Section A.

*Stings.*—See *Bites and Stings.*

*Stomach Ache.*—See *Gastralgia.*

*Stomach, Irritability of.*—See *Carminatives and Sedatives, Stomachic.*

—— *Ulceration of.* Argenti Oxid., Argenti Nitras, Bismuth. Carb., Opium, Peptonised Foods.

*Stomatitis, Ulcerative.* Alum, Borax, Tinct. Myrrhæ et Boracis.

**Stomachics.**—Section A.

*Strangury.* Camphor.

**Styptics.**—Section A.

**Sudorifics.**—Section A.

*Sunstroke.* Antipyrin, Cold Douche.

*Sweating, Hectic.* Acetum, Acid. Acetic. Dil., Acid. Gallic., Acid. Sulph. Dil. See also *Anthidrotics,* Section A.

*Syncope.* Ammon. Spir. Arom., Æther, Spiritus Vini Gallici.

*Synovitis, Chronic.* Emp. Ammon. c. Hydrarg., Hydrarg. Oleas, Ung. Iodi or Tinct. Iodi. (inject.), Blisters.

*Syphilis, Primary and early secondary:* Hydrargyrum, Compounds of.

—— *Late Secondary and Tertiary:* Iodum and the Iodides. *Mineral Waters:* Aix-la-Chapelle, Kreuznach, Vals, Woodhall.

*Syphilitic Nodes.* Emplastrum Hydrargyri, Potassii Iodidum, Sodii Iodidum.

—— *Warts.* See *Warts, Syphilitic.*

—— *Ulcers:* Iodoformum, Iodi Causticum, Ung. Amyli Iodidi, Lotio Hydrarg. Flava or Nigra.

*Tabes Mesenterica.* Morrhuæ Oleum, Ferrum preparations of, Quinina.

*Tape Worm.*—See *Anthelmintics,* Section A.

*Teeth, Caries of.* Arsenical Paste, Cocaina, Chloral cum Camphora et Cocaina, Creasotum, Mastic Dentaire.

*Tetanus.* Aconitum, Amyl Nitris, Atropina, Cannabis Indica, Chloral Hydras, Curare, Physostigma.

*Tetter.* Picis Unguentum.

*Thirst, to allay.* Acid. Citricum, Acid. Phosphoricum, Acid. Tartaricum.

*Throat, Sore.* See *Sore Throat.*

*Thrush.* See *Aphthæ.*

*Tic Douloureux.* See *Neuralgia.*

*Tinea Capitis.* See *Ringworm.*

**Tonics.**—Section A.

*Tonsils, Enlarged. Internally.* Potassii Iodidum, Ammonii Bromidum, Potassii Bromidum. *Locally:* Iodum cum Glycerino or Tinct. Iodi.

—— *Inflamed. Internally:* Aconitum, Antim. Tart., Belladonna, Guaiaci Trochisci, Hydrarg. c. Creta, Sodii

Salicylas. *Locally:* Alum, Acid. Carbolic., Cocaina, Hydrargyri et Morphinæ Oleas, Potass. Chloratis Trochisci.

—— *After Excision of.* Trochisci Althææ.

*Toothache.* Acid. Sulphuros. (Spray), Caffeina, Cajuputi Oleum, Capsici Tinct. Fortior, Caryophylli Oleum, Chloral cum Camphora et Cocaina, Chloroform. c. Camphorâ, Creasotum, Gelsemii Tinctura, Phenol-Camphor, Pyrethrum, Quininæ Ammoniata Tinctura.

*Trichinosis.* Glycerinum.

*Tubercles, Syphilitic.* Hydrarg. Nit. Acid. Liquor.

*Tuberculosis.* See *Phthisis and Scrofula.*

*Typhoid Fever.*—See *Fever, Typhoid.*

*Typhus.* Acid. Hydrochlor. Dil., Alcohol, Antim. Tart., Chloral, Limonis Succus, Ricini Oleum, Opium, Quinina.

*Ulcers.* Acid. Boracic., Argenti Nitras, Calcis Chlorinatæ Liq., Creta Præparat., Cupri Sulphas, Plumbi Acetas, Plumbi Carb., Resinæ Emp., Sabina, Zinci Sulphas, Zinci Ox. Ung.

—— *Cancerous.* Acid. Chromic., Antim. Chlor. Liquor., Potassa Caustic.

—— *Foul or Fœtid.* Acid. Carbolic., Acid. Chromic., Acid. Salicylic., Acid. Sulphuros., Bismuthi Subiod., Calcis Chlorinatæ Liquor, Carbo Animal. Purif., Carbo Ligni, Cataplasma Fermenti, Chlori Liq., Calx Chlorin., Eucalypti Ung., Iodoform., Potass. Permanganas, Resorcin, Sodæ Chlorinatæ Liquor, Zinc. Chloridum.

—— *Indolent.* Acid. Chromic., Alumen Exsic., Argent. Nit., Bals. Peruv., Benzoini Tinct. Co., Cupri Acetas, C. Subacetas, C. Sulphas, Elemi Ung., Hydrarg. Lin., Hydrarg. Oxid. Rubr. Ung., Ichthyol., Kino Pulv., Lotio Rubra, Resinæ Ung., Sabinæ Ung.

—— *Sloughing.* Iodoform.

*Uræmia.* Venesection, Digitalis, Elaterium, Pulv. Jalapæ Co., Pilocarpina (hypodermic), Potass. Bromid., Chloral Hydras, Chloroformum (inhalation).

*Urine, Excess of Uric Acid in.*—See *Antilithics,* Section A, also *Gout, Calculi, &c.*

*Urine, Phosphatic.* See *Antilithics.* Section A, also *Calculi.*

—— *Incontinence of.* Acid. Benzoic., Belladonna, Chloral, Creasotum, Ergota, Ferri Perchlor. Tinct., Quinina, Strychnina.

—— *Putrid.* Acid. Carbolic., Betol., Creasotum, Carbo Animal., Salol.

—— *Retention of.* Opium.

*Urticaria.* Liquor Calcis, Ung. Zinci.

*Uterus, Hæmorrhage of.* See *Hæmorrhage.*

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—— *to contract.* See *Ecbolics.* Section A.

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*Varicose Veins.* Tinct. Ferri Perchlor., Hamamelis.

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*Warts.* Acid. Acetic. Glaciale, Acid. Chromic., Acid. Nitric., Argenti Nitras, Cupri Oleatis Ung., Sodii Ethylatis Liquor.

—— *Syphilitic.* Argenti Nit., Hyd. Iod. Rub. Ung., Hyd. Nit. Acid. Liquor.

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*Wax, indurated.* Glycerinum, Oleum Amygdalæ.

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*Worms, Ascarides, Tape, and Round Worms.*—See *Anthelmintics* Section A.

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